DOCUMENT RESUME

ED 402 726 EC 305 256

| | |
|---|---|
| AUTHOR | Thomas, Dale F.; Menz, Fredrick E. |
| TITLE | The Vocational Assessment Protocol: Development and Validation. |
| INSTITUTION | Rehabilitation Inst. of Chicago, Ill.; Wisconsin Univ. - Stout, Menomonie. Rehabilitation Research and Training Center on Improving Community-Based Rehabilitation Programs. |
| SPONS AGENCY | National Inst. on Disability and Rehabilitation Research (ED/OSERS), Washington, DC.; Rehabilitation Services Administration (ED), Washington, DC. |
| PUB DATE | Feb 96 |
| NOTE | 101p.; For revised user's manual and protocols, see EC 305 255. |
| AVAILABLE FROM | University of Wisconsin-Stout, Research and Training Center, 214 10th Avenue, Menomonie, WI 54751-2506 ($22.75). |
| PUB TYPE | Reports - Descriptive (141) |
| EDRS PRICE | MF01/PC05 Plus Postage. |
| DESCRIPTORS | Adults; Community Based Instruction (Disabilities); Employment Potential; *Evaluation Methods; *Head Injuries; Interviews; Measures (Individuals); *Neurological Impairments; Profiles; Questionnaires; Rating Scales; Severe Disabilities; Supported Employment; *Test Construction; Test Reliability; Test Validity; Vocational Aptitude; *Vocational Evaluation; Vocational Rehabilitation |
| IDENTIFIERS | Case Management; Functional Assessment; *Vocational Assessment Protocol |

ABSTRACT

This report describes a 48-month project which developed, field tested, and evaluated the utility of the Vocational Assessment Protocol (VAP) for use with persons with traumatic brain injury resulting in a severe and persistent disability. The VAP is intended to assist in the community-based vocational rehabilitation of these individuals. The VAP incorporates recognized practices and principles concerning: case management of persons having long-term medical, physical, and psychological needs; sustaining persons in various types of protected, sheltered, and competitive employment situations; and maintaining least restrictive and most appropriate independent living arrangements. After an introductory section, Part 2 of the report discusses the nature, intent, and philosophy of the research and details development of the instrumental process, procedures, and profiles. Barriers to employment are identified and the importance of addressing these issues is stressed. The developmental research underlying the VAP's organization is described. Stages of the instrument's development are outlined and the results of conferences and roles of specific project components are summarized. Part 3 reviews how the instrumentation and procedures were developed and provides detailed discussion of how the VAP is used. Part 4 describes the samples and procedures used in the pilot study validation. Results from the pilot and validation studies are then detailed. (Contains 69 references.) (DB)

ED 402 726

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

# The Vocational Assessment Protocol

## DEVELOPMENT AND VALIDATION

February 1996

*Project conducted in collaboration between November 1990 and December 1994 by the*

Midwest Regional Head Injury Center for
Rehabilitation and Prevention at the
Rehabilitation Institute of Chicago
Chicago, Illinois

*and*

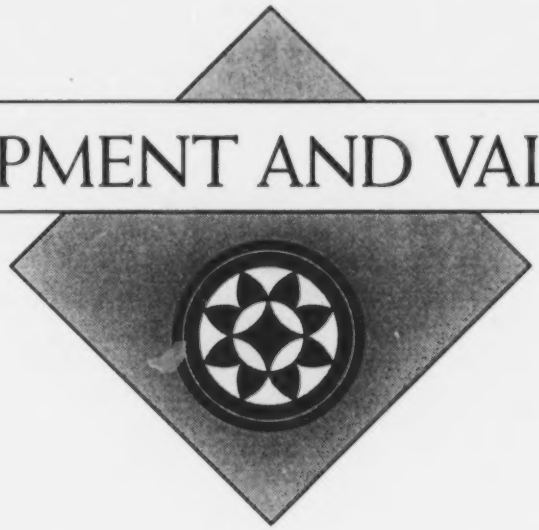
Dale F. Thomas, Ph. D.
Fredrick E. Menz, Ph. D.

Rehabilitation Research and Training Center
on Improving Community-Based Rehabilitation Programs
University of Wisconsin-Stout
Menomonie, Wisconsin

EC 305 256

# The Vocational Assessment Protocol

## DEVELOPMENT AND VALIDATION



February 1996

*Project conducted in collaboration between November 1990 and December 1994 by the*

Midwest Regional Head Injury Center for
Rehabilitation and Prevention at the
Rehabilitation Institute of Chicago
Chicago, Illinois

*and*

Dale F. Thomas, Ph. D.
Fredrick E. Menz, Ph. D.

Rehabilitation Research and Training Center
on Improving Community-Based Rehabilitation Programs
University of Wisconsin-Stout
Menomonie, Wisconsin

Copyright © February, 1996

Rehabilitation Research and Training Center
Stout Vocational Rehabilitation Institute
College of Human Development
University of Wisconsin-Stout
Menomonie, Wisconsin 54751

Funding for this project was provided by the U.S. Department of Education, Office of Special Education and Rehabilitation Services, Washington, D.C. Funds were provided by the Rehabilitation Services Administration, through the Midwest Regional Head Injury Center for Rehabilitation and Prevention, and by the National Institute on Disability and Rehabilitation Research, through the Research and Training Center.

## Acknowledgments

The development of materials included in this manual was made possible by the effort of joint collaboration involving several organizations. The original research with the Vocational Assessment Protocol (VAP) was conducted by the University of Wisconsin-Stout Rehabilitation Research and Training Center (UW-Stout RRTC). Specific funding provided by the Rehabilitation Services Administration to the Midwest Regional Head Injury Center for Rehabilitation and Prevention at the Rehabilitation Institute of Chicago made further development of this instrumentation possible.

The Regional Center provided not only dollars to assist in the development of this instrument, but also invested staff resources, time, and strong encouragement to produce the manual and instrumentation that is presented herein. Midwest Regional Head Injury Center jointly sponsored three training programs to bring together staff from around the region and throughout the country to provide an adequate validation sample for research purposes. The true spirit of joint collaboration was brought about by Cynthia Sisk, Donald Olson, Mary Jane Tanquary, Robynn Kobayashi, and Laura Dunlap. They brought more energy, personal commitment, and exceptional interest in working with us to get the right people, to obtain the best input and guidance, and to make available needed opportunities that permitted us to explore the concepts underlying the Protocol, to elaborate and test them out during advisory meetings, and to assist us to focus energies and skills into developing and validating the process and instrumentation that emerged through well established field sites.

Many consumers of services to persons with traumatic brain injury (including brain injury survivors and their significant others) were also involved in this process. Using input from the Constituency Advisory Committees, consumers, and advisory members of the Midwest Regional Head Injury Center, additional refinements to training curricula as well as the Vocational Assessment Protocol were completed.

Names of organizations and individuals listed on the inside cover identify some of the persons who were involved in efforts to collect data, and provide feedback which makes the Vocational Assessment Protocol useful. Staff of the Rehabilitation Research and Training Center at the University of Wisconsin-Stout extend our full and unqualified appreciation to these individuals and organizations, and dedicate this manual to the survivors of traumatic brain injury who were involved in the validation of the instrumentation included in the Vocational Assessment Protocol.

Advisors and critics of the Vocational Assessment Protocol who helped shape the direction, content, and spirit of this instrumentation include Marilyn Spivack, James Malec, Mitch Rosenthal, Jeff Smigielski, Nancy Crewe, and Audrey Nelson. Several students conducted master's theses and dissertations which also contributed to the body of knowledge leading to the development of the Vocational Assessment Protocol. These individuals include Bonnie Roush, Audrey Nelson, Dana Catalogna, Becky Michaels, Dena Manier, Sharon Zachow, Tom Thorsness, Geno Pichette, and John Kosciulek.

Finally, the authors wish to recognize Jean Davis and Julie Larson who are the clerical staff who contributed unmeasureably to the development of this instrumentation by producing

all printed material used in this project, arranging meetings, and keeping track of all data, products, and work schedules.

To each of you, thank you for your contributions and making this research project workable and our product usable.

Fredrick E. Menz
Dale F. Thomas
January, 1996

# Table of Contents


**Acknowledgments** . . . . . iii
**Table of Contents** . . . . . v
**List of Tables** . . . . . ix

**I. Overview of Project and Final Report** . . . . . **I-1**

Overview . . . . . I-1
Goals and Objectives . . . . . I-1
Organization of Final Report . . . . . I-2

**II. Background and Development** . . . . . **II-1**

Review of Relevant Research Literature . . . . . II-1
Uniqueness in Needs . . . . . II-1
Employment and Return to Work . . . . . II-1
Barriers Subsequent to Brain Injury . . . . . II-2
Physical Barriers . . . . . II-3
Cognitive Barriers . . . . . II-2
Psychosocial Barriers . . . . . II-3
Problems Resulting From Accidents . . . . . II-3
Other Barriers to Community Integration and Employment . . . . . II-3
Summary of Relevant Characteristics From Pilot Research . . . . . II-4
Development and Preceding Research . . . . . II-5
The Vocational Adaptivity Scale . . . . . II-5
Project ADAPT . . . . . II-6
The Head Injury Re-entry Project (Project HIRe) . . . . . II-7
Clinical Advisory Committee . . . . . II-8
Atlanta Think Tank . . . . . II-9
Clearwater Beach Conference . . . . . II-9

**III. The Vocational Assessment Protocol** . . . . . **III-1**

What is the Vocational Assessment Protocol? . . . . . III-1
What the Vocational Assessment Protocol is Not . . . . . III-1
Elements of the Vocational Assessment Protocol . . . . . III-2
Background Information Interviews (Profiles) . . . . . III-2
Clinical Rating Profiles . . . . . III-2
Vocational Adaptivity Profiles . . . . . III-2
Structural Summary Section (Optimal) . . . . . III-3
The 11-Step Process . . . . . III-3
Step 1. Gathering Background Information . . . . . III-3
Profile A—Personal Demographic Questionnaire . . . . . III-3
Profile B—Personal Demographic Interview . . . . . III-5
Sources of Additional Background Information . . . . . III-6

## Table of Contents (continued)


Similarities and Differences in the Personal Demographic Questionnaire and Personal Demographic Interview . . . . . III-6

Step 2. Profiling Clinical Background Information . . . . . III-7
Profile C—Physical Profile . . . . . III-8
Profile D—Social-Emotional Profile . . . . . III-9
Profile E—Neuropsychological Profile . . . . . III-10
Ratings of General and Job Goal Related Traits . . . . . III-13
Identifying Strengths and Assets . . . . . III-13
Step 3. Intake and Assessment Planning . . . . . III-14
Step 4. Formalize and Operationalize Referral Questions . . . . . III-14
Step 5. The Intake Interview . . . . . III-15
Step 6. Initiating the Evaluation . . . . . III-16
Step 7. Identifying Vocational Interests and Work Needs . . . . . III-16
Defining Work Interests . . . . . III-16
Occupational Exploration . . . . . III-16
Vocational Counseling . . . . . III-17
Step 8. Situational Assessment and Job Search . . . . . III-17
Profile F—Job Search Skills Profile . . . . . III-17
Profile G—Interviewing Skills Profile . . . . . III-18
Step 9. Situational Assessment and Job Retention . . . . . III-19
Profile H—Critical Work Behavior Profile . . . . . III-19
Profile I—Social Adaptive Behavior Profile . . . . . III-20
Step 10. Community-Based Job Trials . . . . . III-22
Step 11. Develop the Evaluation Report and Complete a Structural Summary . . . . . III-22

**IV. Research and Development Results . . . . . IV-1**

Scope of Methodologies . . . . . IV-1
The Pilot Study . . . . . IV-3
Pilot Sites . . . . . IV-3
Site Development and Training . . . . . IV-3
Pilot Version and Consequent Revisions . . . . . IV-4
The Family Interview and Background Information Questionnaire of Traumatic Brain Injury Survivors . . . . . IV-4
The Functional Assessment Inventory . . . . . IV-4
The Vocational Adaptivity Scale . . . . . IV-4
The Performance Profiling Forms . . . . . IV-5
Program Path and Evaluation Strategy Form . . . . . IV-6
Statistical Analyses with the Vocational Assessment Protocol Pilot Version . . IV-6
Performance Profiles . . . . . IV-7
Vocational Adaptivity . . . . . IV-7
The Validation Study . . . . . IV-8
Validation Sites . . . . . IV-8

## Table of Contents (continued)


Training of Practitioners . . . . . IV-8
Subjects . . . . . IV-9
Profile A—Personal Demographic Questionnaire . . . . . IV-9
Demographics . . . . . IV-9
Education . . . . . IV-9
Developmental History . . . . . IV-9
Causes and Types of Injuries . . . . . IV-9
Causes . . . . . IV-9
Brain Injuries . . . . . IV-10
Other Injuries . . . . . IV-10
Impact of Injury on Employment and Income . . . . . IV-10
Current and Recurring Problems Resulting from Head Injury . . . . . IV-10
Cognitive, Physical, Sensory, and Motor Problems . . . . . IV-10
Psychosocial Problems . . . . . IV-10
Mobility and Independence Needs . . . . . IV-11
Profile B—Personal Demographic Interview . . . . . IV-11
Changes for the Worse that are Common . . . . . IV-11
Less Consistent Changes . . . . . IV-12
Disagreements Between Individuals and Significant Others Regarding Changes . . . . . IV-12
Profile C—Physical Profile . . . . . IV-12
High Incidence Problems . . . . . IV-12
Lesser Problems . . . . . IV-12
Profile D—Social-Emotional Profile . . . . . IV-13
High Incidence Problems . . . . . IV-13
Lesser Problems . . . . . IV-13
Profile E—Neuropsychological Profile . . . . . IV-13
High Incidence Problems . . . . . IV-13
Lesser Problems . . . . . IV-13
Profile F—Job Search Profile . . . . . IV-13
High Incidence Problems . . . . . IV-13
Lesser Problems . . . . . IV-14
Profile G—Interviewing Skills Profile . . . . . IV-14
High Incidence Problems . . . . . IV-14
Lesser Problems . . . . . IV-14
Profile H—Critical Work Behavior Profile . . . . . IV-14
High Incidence Problems . . . . . IV-14
Lesser Problems . . . . . IV-14
Profile I—Social Adaptive Behavior Profile . . . . . IV-15
High Incidence Problems . . . . . IV-15
Lesser Problems . . . . . IV-15
Program Path and Evaluation Strategy Form . . . . . IV-15
Evaluation Procedures . . . . . IV-15
Post-Assessment Referrals . . . . . IV-16
Vocational Limitations . . . . . IV-16

## Table of Contents (continued)


Vocational Service Needs Inventory . . . . . IV-16
Multiple Services Needed . . . . . IV-16
Job Site Services . . . . . IV-16
Work Preparation Services . . . . . IV-16
Assessment Services . . . . . IV-17
Psychotherapeutic or Counseling Services . . . . . IV-17
Medical Related Services . . . . . IV-17
Estimation of Reliability and Validity . . . . . IV-17
Statistical Approaches . . . . . IV-17
Reliability . . . . . IV-17
Demographic and Vocational Profiles . . . . . IV-17
Nonvocational Profiles . . . . . IV-18
Factor Analyses . . . . . IV-18
Additional Evidence . . . . . IV-18
Personal Demographic Questionnaire . . . . . IV-18
Personal Demographic Interview . . . . . IV-19
Conclusions and Recommendations . . . . . IV-19
Continuing Development . . . . . IV-20
Research and Psychometric Issues . . . . . IV-20

**V. Bibliography** . . . . . **V-1**

# List of Tables

**Table**


II-1. Problems Resulting From the Accident (Rousch, 1989) . . . . . II-11

IV-1. Initial Reliability Analyses and Factor Analyses of the Performance Profiling Forms and the Vocational Adaptivity Scales . . . . . IV-22

IV-2. Summary of Demographic Responses . . . . . IV-23

IV-3. Summary of Individual and Significant Other Observed Changes in Individual's Behaviors . . . . . IV-30

IV-4. Comparison of Problems Identified by Individual and a Significant Other on the Personal Demographic Interview . . . . . IV-31

IV-5. Summary of General and Job Goal Specific Problem Areas Identified on the Physical Variables Profile . . . . . IV-32

IV-6. Summary of General and Job Goal Specific Problems Identified on the Social-Emotional Profile . . . . . IV-34

IV-7. Summary of General and Job Goal Specific Problems Identified on the Neuropsychological Profile . . . . . IV-35

IV-8. Summary of Job Search Problems . . . . . IV-38

IV-9. Summary of Problems Identified in Interviewing Skills . . . . . IV-39

IV-10. Summary of Problems Identified in Critical Work Behaviors . . . . . IV-40

IV-11. Summary of Problems Identified in Social Adaptivity . . . . . IV-41

IV-12. Strategies Used in Evaluation . . . . . IV-42

IV-13. Identified Service Needs From Structural Summary . . . . . IV-43

IV-14. Reliability Analysis for Vocational Assessment Protocols: Dichotomous and Clinical Scaling . . . . . IV-45

IV-15. Principal Components Factor Analyses on Vocational Assessment Protocol Profiles: Clinical Ratings Scaling . . . . . IV-46

# I. Overview of Project and Final Report

## Overview

This study investigated the utility of the Vocational Assessment Protocol (VAP) for use with persons with traumatic brain injury. The goal of this initiative was to produce a protocol including processes and instrumentation that can be adapted by community-based programs developing programs for persons with traumatic brain injuries. Several data collection instruments were examined that serve as the core of the VAP data management system. Through the process of field testing the VAP, a practical approach to profiling critical information relevant to vocational rehabilitation of persons with a traumatic brain injury was developed.

The instrumentation used in this study was developed from a long line of research conducted by the University of Wisconsin-Stout Rehabilitation Research and Training Center. Portions of the instrumentation have been taken from the Vocational Adaptivity Scale (Thomas, 1983) with interview sections taken from the Wisconsin Study (Thomas, Czerlinsky, & Smigielski, 1987). Other content areas identified as important for inclusion in this assessment protocol were derived in part during the course of a consensus conference conducted under the auspices of the Atlanta Think Tank sponsored by the Head Injury Re-entry Project (Thomas & Menz, 1990).

The VAP is organized in a format for documentation and summation of functional behaviors related to return to work following a traumatic brain injury. The VAP has been field tested with initial adaptations made on the basis of a statistical analysis. Presently the VAP is in its final format, which as field tested exhibited acceptable reliability and validity of the instruments and the processes included with the protocols.

## Goals and Objectives

The goal of this 48-month research project was to develop and field test a model of conducting a comprehensive vocational assessment in order to provide functional information for use in long-term case management of persons who have sustained a traumatic brain injury resulting in a severe and persistent disability. The VAP incorporates practices that have been proven to be necessary and effective in (a) case management of persons having long-term medical, physical, and psychological needs; (b) sustaining persons in various types of supported, protected, sheltered, and competitive employment situations; and (c) maintaining the least restrictive and most appropriate independent living arrangement.

To achieve this goal, the following research objectives were pursued during the course of this study:

1. Define, implement and evaluate a vocational evaluation protocol for clients with traumatic brain injury to accurately predict training and placement needs.

2. Develop, present, and evaluate workshops on vocational evaluation approaches to

brain injury for other vocational evaluators at community-based rehabilitation centers and in other settings.

3. Disseminate findings from this project through publications and a training program emanating from the research.

## Organization of Final Report

Part II of this report begins by introducing the nature, intent, and philosophy of the research, and provides background information that details how the instrumentation, process, procedures, and profiles were developed. Reviews of relevant research literature are selectively included to provide a tone for how the process and procedures were originally developed. Barriers to employment including difficulties with physical, cognitive, and psychosocial problems are identified, and the importance of addressing these issues in a comprehensive vocational assessment is described by summarizing a study completed by Roush (1989) that detailed the importance of elements in the Vocational Assessment Protocol to solid vocational planning.

Next, the developmental research that led to the organization of the VAP is described, including preliminary findings. Developmental stages including development of the Vocational Adaptivity Scale, further development of this instrument under Project ADAPT, and revision and reapplication of this processes under Project HIRe are reviewed. The role of the clinical advisory committee in guiding the research leading to the Traumatic Variables Compendium that served as the basic roots of the VAP are defined. The various conferences including the Clearwater Beach conference and the subsequent Philadelphia conference on community-based employment of traumatic brain injury are discussed, as they relate to literature that eventually developed, including textbooks on community-based employment and traumatic brain injury that served as critical key training elements during the course of this 4-year project with all participants. Finally, the role and involvement of staff from the Midwest Regional Head Injury Center for Rehabilitation and Prevention at the Rehabilitation Institute of Chicago are reported.

Part III reviews how the instrumentation and procedures were developed and provides detailed discussion of how the VAP is used. Part IV describes the samples and procedures used in the validation of this pilot study. Results from the pilot and validation studies are then described in detail.

# II. Background and Development

## Review of Relevant Research Literature

As vocational rehabilitation programs began to accumulate experience working with persons with traumatic brain injury (TBI), it has become apparent that the nature of the sequelae and resulting disability are substantially different form that of other disabilities (Levin, Benton, & Grossman, 1982). Approaches to case management and employment development, however, have been based on methods used successfully with persons diagnosed as mentally retarded or who have a serious and persistent mental illness (Lezak, 1987). These types of approaches may be similar in some respects, such as the fact that lifelong services or service access may be necessary (Wehman & Kreutzer, 1990) and the fact that a cadre of services are often required to maintain the person in an integrated community setting (Wehman, West, Sherron, Groah, & Kreutzer, 1993).

### Uniqueness in Needs

The needs of the person with a traumatic brain injury though, are substantially different in many other respects, and, therefore, demand a different type of service delivery. One of the primary differences between this population and other disability groups is the fact that these individuals may overtly appear more independent and vocationally competent than experience will bear out (Lezak, 1987). Furthermore, they often maintain their pre-injury vocational aspiration, even though their job-related skills may be considerably different since their injury (Thomas & Menz, 1990). The cognitive, personality, and behavioral deficits that are a direct result of cognitive dysfunction are often difficult to diagnose and recognize by lay-persons (Thomas & Menz, 1990), especially when problem behaviors and skill deficits are inconsistently exhibited.

### Employment and Return to Work

Employment becomes difficult to seek and maintain after experiencing a brain injury because of several factors. These include deficits directly resulting from the injury, lack of understanding and education about brain injury on the part of vocational rehabilitation professionals, and lack of supports both on the job and in the community (Corthell, 1990).

It is difficult to calculate rates of unemployment for survivors of traumatic brain injury due to differences in definitions of employment, severity of the injury of clients served, changes in medical technology (i.e., increasing the rate of severe injury survival), and intensity of services delivered. Each study that reports employment statistics must be considered as it applies to the individuals involved in the study (Kay, 1993). Making generalizations from studies conducted at a singular site may in fact be misleading since labor market conditions, resources of the site, and nature of the persons served tend to vary widely.

Brooks, Campsie, Symington, Beattie, and McKinley (1987) found that only 29 percent of individuals who were employed prior to experiencing a brain injury were working seven years following their injury. Further analysis revealed that those who returned to work were more

likely to have had management level positions prior to their injury. There also appeared to be a relationship between age at injury and return to work. Apparently, 39 percent of those who were under 45 years of age returned to work, while only 12 percent of those who were over the age of 45 at the time of injury returned.

Jacobs (1987) in a follow-up study of 142 individuals who were employed at the time of injury found that 27 percent were employed one to six years post-injury. Thirteen percent had returned to work, but had lost their job before the follow up interview. Another study of 78 individuals placed in a supported employment program (Sale, West, Sherron, & Wehman 1991) reported 38 "job separations."

In a summary of return-to-work studies, Trexler (in Thomas, Menz, & McAlees, 1993) estimated that 30 percent of individuals with brain injury return to work. Trexler concluded that the primary reason for failure in employment is related to cognitive and emotional/behavioral disorders displayed on the job. Other more recent data suggest more optimism for return-to-work potential (Millis, Rosenthal, & Lourie, 1994), although definitions of employment and gainful activity vary widely between studies making comparisons of relative outcomes difficult.

Because of the diverse possible consequences of brain injury, a vocational evaluation must be comprehensive, allowing for flexibility for individual needs and differences, drawing upon information from varied sources, and using an array of methodologies of assessment. Most sources report that an injury to the brain can result in a complex set of variables, most of which can affect one's ability to seek, attain, and sustain employment (Krankowski & Culbertson, 1993; Chan, Dial, Schleser, McMahon, Shaw, Marme, & Lam, 1991; Cook, 1990, Thomas, 1990.

**Barriers Subsequent to Brain Injury**

Factors affecting an individual's return to work after experiencing a brain injury are numerous, and it is difficult to predict individual outcomes based on generalizations made for the population as a whole. Researchers have attempted to define common barriers to successful employment, which has been difficult for many reasons including problems in conducting long-term follow up, the dynamics of the recovery process, inconsistent definitions of employment, severity of injury, and the lack of a comprehensive measurement process to ensure all relevant factors are assessed. Most studies published, however, tend to agree that areas of functioning commonly affected by brain injury include physical capacities, cognitive abilities, executive functioning, and psychosocial skills (Kay, 1993; Devany, Kreutzer, Galberstadt, & West, 1991; Ezrachi, Ben-Yishay, Kay, Diller, & Rattok, 1991).

**Physical Barriers**. Thomas (1989) lists numerous possible physical effects of brain injury including weakness, lack of hot and cold sensitivity, spasticity or tremors, contractures, dexterity, coordination, balance, vision, hearing speech, taste, smell, seizures, and respiratory problems. Kay (1993) states that the six common areas of physical deficits after brain injury are sensory-motor deficits, motor control and coordination difficulties, fatigue, seizure disorder, decreased tolerance for drugs and alcohol, and headaches. The extent to which physical deficits appear to be linked to the severity of the injury increases the possibility of damage to the brain

stem area (Kay, 1993).

**Cognitive Barriers**. Cognitive problems are more likely when there is damage to frontal lobe areas of the brain or if there is diffuse damage (Lezak, 1987). The cognitive problems that are common after brain injury include reduced fund of information, impaired conceptual reasoning ability, limited abstract thought ability, reduced vocabulary use, problems in arousal, attention deficits or distractibility, visual perceptual problems, memory deficits (auditory, visual, and recall), planning and executing goals, analyzing social situations, adjusting personal behavior, and sequencing motor acts (Thomas, 1989). Reports from speech therapists, occupational therapists, and neuropsychologists are useful in planning a vocational evaluation that takes into consideration individual cognitive abilities and limitations.

**Psychosocial Barriers**. Common psychosocial difficulties include inflexibility or awkwardness in social settings, impulsiveness and inability to inhibit remarks, and to a lesser degree, sexual precociousness, and physical intrusiveness (Thomas, 1989; Trexler, 1993). This area is especially important to consider in vocational assessment. Most individuals with a brain injury lose their jobs because they have difficulty in interpersonal relationships with supervisors and co-workers (Kay, 1993). It is also important to assess psychosocial abilities and limitations in various environments as a person may react differently with changes in amount of structure and distractions (Thomas, 1989).

**Problems Resulting From Accidents**. In a study by Roush (1989), Roush gathered data on 38 individuals with brain injury who were involved in vocational rehabilitation services. Deficits in five major categories were reported and rated as to their impact on vocational planning. The results are listed in Table II-1.[1] Five categories are represented in these problems: physical, sensory and motor, psychological, executive dysfunction, and emotional related problems.

Of the 38 individuals studied, over one-third experienced difficulties in vision, had seizures, and were considered behaviorally out of control. Over one-half were reported to have difficulties with balance, walking, coordination, writing, attention, receptive communication, expressive communication, visual spatial perception, sequencing, self-monitoring abilities, depression, anxiety, and anger. Even more significant was that nearly 90 percent of the individuals had experienced difficulties with one or more of the following: memory, organization and planning, planning and executing goal directed behavior, and frustration.

**Other Barriers to Community Integration and Employment**. Kay (1993) stresses that person and environmental variables must also be assessed. He states that "prior personalities, life styles, successes, and failures of present clients before injury need to be reviewed in light of current deficits and vocational goals." The environmental variables Kay mentions that affect return to work involve psychosocial aspects, service-delivery options, fund availability, and employers.

Kay reports that the availability, range, and quality of vocational rehabilitation services

[1]All tables for this report will be at the end of the section in which they are discussed.

are factors affecting return to work. Employability is also affected by the ability to finance services. Funding is often determined by uncontrollable variables such as the cause of injury (i.e., work related, personal injury, crime related), insurance policy provisions, state and federal laws, and budget allocations. From this review it is evident that the vocational evaluation should focus upon vocational potential of individuals with brain injury in a comprehensive, flexible, prescriptive manner tailored to the needs of each individual and his/her community.

**Summary of Relevant Characteristics From Pilot Research**

As part of the development of the VAP, 20 persons in Region V, including Wisconsin, Minnesota, Michigan, Illinois, Indiana, and Ohio, were profiled on instruments constituting the VAP. Site staff collecting the data were vocational rehabilitation specialists who also had responsibilities of conducting vocational appraisals. The majority of the people profiled had sustained a serious head injury. The average length of coma was 24 days. The average post-traumatic amnesia period reported was 86 days. The majority of the subjects sustained a closed-head injury from a motor vehicle accident. Other significant physical injuries were also reported such as arm, leg and back injuries.

Results of an assessment using the Vocational Adaptivity Scale demonstrated that the majority of all subjects had less than adequate job-search skills. Likewise, interviewing skills were also judged to be marginal. The general work skills of these individuals were estimated to be somewhat better as were supervisory relations. Social adaptive behaviors including demonstrating courtesy to others and working without distraction were rated as adequate. General cognitive functions of attention and concentration, maintenance of a problem-solving set, decision-making ability, and self-regulation, however, were problematic for the majority of this population. Likewise, the majority exhibited difficulties in all the memory areas rated, with the notable exception that nearly half of the individuals were rated as having a good historical memory.

Communication skills were impaired greatest in the area of writing, with nearly half the persons exhibiting difficulty with spontaneity and speech. Psychomotor skills were less problematic for this population. A review of the difficulties encountered in the areas of mental health issues suggested significant problems. Difficulties with anxiety and depression topped the list. Few individuals exhibited problems with auditory or visual hallucinations. Sensory problems were generally unimpaired for the majority of the individuals in this study with the exception of visual system problems which were common in nearly half of these individuals. Social adjustment problems occurred in the areas of accuracy, self-appraisal, common sense, social sense, and spontaneity. Ability to independently search for work was rated to be poor.

The length of vocational assessments were found to vary widely. The average was 14 days with wide variations noted among the individual cases. The wide variations found in days in evaluation suggested that evaluators were flexible in terms of time scheduling on the basis of individual needs.

## Development and Preceding Research

Development of the Vocational Assessment Protocol resulted from a change in service populations and a shift in the philosophy in the field of vocational rehabilitation. Vocational evaluation for persons with brain trauma injuries needed to involve not only the assessment of work related skills and capacities but also the assessment of other critical work behaviors (i.e., adaptivity, peer and supervisor relationship skills) and environmental and social supports (i.e., housing, family involvement, transportation). Community-based employment services also changed emphasis in order to focus efforts on assisting individuals with disabilities, regardless of severity, to secure and maintain jobs in the community.

The development of the Vocational Adaptivity Scale (Thomas, 1983) laid the groundwork for the development of a means of documenting functional work skills in an organized and objective manner. The Vocational Adaptivity Scale assessed work behaviors and was targeted for use with individuals with cognitive disabilities or mental retardation.

As individuals with traumatic brain injury became recognized as a larger segment of clients served in vocational rehabilitation programs, it became evident services tailored for persons with brain injuries were necessary. A vocational evaluation that covered all the variables that needed to be assessed was difficult to conduct Due to demands of families, survivors of brain injury, and service providers, examination of vocational services for individuals with brain injury became a priority of the Department of Education's Rehabilitation Services Administration. Funds were awarded to the Research and Training Center at the University of Wisconsin-Stout to begin research in the development of effective community-based vocational rehabilitation models.

The following is a summary of the events leading to development of the VAP. The VAP evolved during the course of 10 years of research and clinical experience that involved several research studies involving consumer-provider consensus meetings sponsored by the Research and Training Center, University of Wisconsin-Stout. All efforts focused upon developing instrumentation and processes to assist vocational evaluators in providing comprehensive and functional assessment of work-related skills and behaviors. The most prominent of these research efforts included the development and validation of the Vocational Adaptivity Scale (1983), completion of the Wisconsin Traumatic Brain Injury Survey (1986), and completion of the activities associated with Project HIRe (1987-1991).

### The Vocational Adaptivity Scale

Thomas (1983) identified many of the common psycho-social factors that affect one's ability to obtain and maintain work and compiled this information into the Vocational Adaptivity Scale (VAS). The VAS was developed with the intention of providing a comprehensive rating scale that "combined the vocationally adaptive behaviors and work-related skills suggested by the literature as important to the employability of the (cognitively disabled) worker." Previously, rating scales used in the vocational evaluation of individuals with cognitive limitations assessed primarily work-related skills with little emphasis on work behaviors or adaptive behaviors (Thomas, 1983).

The need for assessment of adaptive behaviors of individuals with mental retardation and other developmental disabilities was derived from the observation that individuals with cognitive disabilities are more likely to lose their job because of poor adaptive skills than are people from other disability groups (Peterson & Foss, 1980). Thomas (1983) cited the American Association of Mental Deficiency (AAMD) 1978 definition of adaptive behaviors as "the ability of the individual to adapt to the demands of the situation in a manner consistent with the norms acceptable for the individual's age and society's expectations of a person's behavior in a social context."

The components of the Vocational Adaptivity Scale were identified by reviewing the literature and selecting the factors found to be related to the employability of individuals with mental retardation. Behaviors identified in the literature were used to develop rating scale items that could be used to assess each behavior (Thomas, 1983). The resulting instrument included 59 items rated on a five-point Likert scale, plus 14 items documenting background information.

The validity of the instrument was evaluated against two criteria. The first was the prediction of placability, defined as the ability to obtain a job. The second was vocational adaptivity, defined by Thomas as the ability to maintain a job for a minimum of 60 days after placement. Hoyt's internal consistency reliability estimate indicated that the rating scale had a high degree of internal consistency ($r=.954$). Inter-rater reliability was found to be moderate with $r=.70$. Content validity was determined by expert judges and was "found to exhibit adequate factor and predictive validity" (Thomas, 1983).

**Project ADAPT**

A further evolution of the VAS occurred when it was modified and incorporated as a component of Project ADAPT, a transition curriculum program for assisting students with mild to moderate cognitive and intellectual handicaps transition from school to work (Thomas, Coker, & Menz, 1988). Project ADAPT, a field initiated research study, was conducted by the Research and Training Center at the University of Wisconsin-Stout. The original VAS was expanded during Project ADAPT by adding items that assessed job search skills and interviewing skills. Twenty-nine additional items that assessed behaviors cited in other placement studies as predictors of employment success were included in the 1988 published version (Thomas, Coker, & Menz, 1988).

The scale for conducting ratings was also changed. The item pool was expanded to include 88 items that were divided into four separate rating forms or profiles and a composite profile to summarize the four rating instruments. The following is a list of the scales in that version of the VAS:

1. The Job Search Strategy Assessment Profile
2. Telephone Inquiry Skills Assessment Profile
3. Personal Interview Skills Assessment Profile
4. Work Supervisor's Assessment Profile
5. Composite Profile

Separate rating forms permitted the evaluation process to expand beyond observations by

only the vocational evaluator to include observations of others who might participate in actual on-site or situational assessments. All ratings were synthesized by the vocational evaluator on the Composite Profile. An individual's previously stated job goals, a background summary, and current levels of math and reading skills are also recorded on the Composite Profile and can be viewed in relation to the behavior ratings from the protocols.

The Vocational Adaptivity Scale was designed for use with the *Employment Readiness Assessment Manual* (Thomas & McCray, 1988) to help teachers consider and make use of the instrument in adapting school curricula and work experiences. While the profiles could be used separately, it was recommended that all be used together.

**The Head Injury Re-entry Project (Project HIRe)**

Project HIRe, a 3-year demonstration and research project, was also conducted by the Research and Training Center at the University of Wisconsin-Stout. The goal of the project was to develop a model for providing community-based employment services to individuals with traumatic brain injury living in rural communities (Thomas & Menz, 1993). This project attempted to provide community-based employment for individuals with brain injuries regardless of severity of injuries.

In the first year of the project, efforts were made to secure as much input as possible about suggested supported employment practices with individuals with traumatic brain injury from a variety of sources. A conscious effort was made to involve perspectives of individuals with traumatic brain injury, their family members and significant others, advocates, and experts in both the public and private sectors of service delivery. Information was gathered through a literature review and input from a Clinical Advisory Council. A National Think Tank and a subsequent national conference solicited additional information from papers presented and feedback from reactors and through audience comments.

In the second phase of Project HIRe, data collected under another project of the Research and Training Center was analyzed to identify consumers needs and barriers to employment for traumatic brain injury survivors. The Wisconsin Brain Injury Survey, conducted in 1986, served as the source of these data. This survey was a cooperative effort of the Research and Training Center (RTC), the Wisconsin Brain Trauma Association (WBTA), the Wisconsin Developmental Disabilities Board, and the Wisconsin Division of Vocational Rehabilitation. The survey was originally intended to measure the incidence of personal, economic, and social losses experienced by individuals with a brain injury in the state of Wisconsin. Over 700 responses were received.

The analysis of the survey data focused on identifying and prioritizing problems and needs associated with brain injury, as reported by respondents. Descriptive and inferential statistical analysis were used to analyze the data and provide information on the incidence of identified rehabilitation problems. The findings from the survey provided a basis for portions of the content of the VAP. Specific items from the survey were subsequently integrated into the initial version of the Personal Demographic Interview, one of the instruments in the VAP.

The final phase of Project HIRe developed and implemented a community-based

employment model for individuals with brain injury that used the input from the Think Tank, the Clinical Advisory Committee, available literature, and input received during the Clearwater Beach Conference.

The Project HIRe model was developed and implemented at two field sites. Two community-based vocational rehabilitation agencies were contracted to participate in the project. The two sites independently implemented the model. Agency staff were provided training and offered technical assistance and all instrumentation to record information and progress of individuals served. A comprehensive discussion of the development and implementation of the model can be found in the final report (Thomas, & Menz, 1993). During the completion of Project HIRe, the VAP in its first experimental format was field tested. Data from this study was later combined with other protocol data to perform initial analyses for validation purposes.

**Clinical Advisory Committee**

Eight clinical consultants were asked to participate on Project HIRe's Clinical Advisory Committee. Consultants were selected because of their expertise in research, clinical and rehabilitation psychology, and client advocacy. This group, which remained active throughout the project, included the following people:

Dale F. Thomas, Ph.D., Research and Training Center
Fredrick E. Menz, Ph.D., Research and Training Center
Mitchell Rosenthal, Ph.D., Rehabilitation Institute of Michigan
Jeffrey S. Smigielski, Ph.D., Mayo Clinic
Thomas Hammeke, Ph.D., Medical College of Wisconsin
James Malec, Ph.D., Mayo Clinic
Gary Wolcott, National Head Injury Foundation
Daniel Keating, Ph.D., Drucker Brain Injury Center

This group was to asked to reach to consensus about the classification and prioritization of the problems and needs of individuals with traumatic brain injury. An analysis of the data resulting from the Wisconsin Survey was the basis for the categories of need proposed to the group for discussion. The input from the group was compiled into a survey document titled the "Traumatic Brain Injury (TBI) Variables Compendium" (Thomas & Menz, 1988). The Compendium was, in fact, a listing of variables deemed important by the committee when conducting a vocational assessment of individuals with brain injury.

The Traumatic Brain Injury Variables Compendium was developed into an instrument intended to examine the most vocationally relevant consequences of brain injury. The Compendium was examined by 60 persons attending the National Think Tank and then subsequent to that by participants in the Clearwater Beach conference. A list of variables that respondents thought to be relevant to the vocational planning with individuals with brain injury was developed as the result of this study. The list was subsequently broken up into three separate profiles, according to likely information sources. The three profiles that evolved were The Neuropsychological Variables Profile, The Social-Emotional Variables Profile, and The Physical Variables Profile.

**Atlanta Think Tank**

A Think Tank on employment after traumatic head injury was held in Atlanta, Georgia, on November 16, 1988, in conjunction with the National Head Injury Foundation's Seventh Annual National Symposium. Fifty-one nationally recognized leaders in brain trauma rehabilitation were asked to contribute to the discussions. The purpose of the event was to promote divergent and innovative approaches to the identification of issues and problems facing the survivors of traumatic brain injury entering community-based employment situations. During the Think Tank, presentations and discussions identified nearly 100 issues relevant to community- based employment of individuals with traumatic brain injury (Thomas & Menz, 1993). These issues assisted in the development of suggested practices that were eventually incorporated into the VAP.

The issues identified were further defined into fifteen global concerns including the need for:

1. Vocationally relevant reports
2. Ecological validity of neuropsychological measures
3. Productivity measurement
4. Meaningful outcome criteria
5. Measuring quality of placement
6. Direct access to rehabilitation services need to be developed
7. Moderator variables
8. Syndrome-based strategies
9. Team interaction models
10. Necessary support systems
11. Compensatory aids
12. Disincentive to community-based rehabilitation
13. Patterns of necessary employment supports
14. Pre-placement skills and prerequisites
15. Training for practitioners

**Clearwater Beach Conference**

Based on the issues raised during the Think Tank, Project HIRe's Advisory Committee set the priorities for the content of a national conference on traumatic brain injury and community-based employment. The goal of this conference was to identify model community-based employment programs; relevant neuropsychological, medical, and vocational assessment procedures; and approaches to public policy issues.

Primary consideration for presentations was given to potential presenters who could show empirical evidence of the effectiveness of their approaches. The conference was held during February 23-25, 1989, in Clearwater Beach, Florida. The format of the sessions allowed for one primary presentation followed by two others that provided either a critical analysis or an alternative viewpoint. The Compendium of Variables as revised was again reviewed by the Clinical Advisory Committee and participants having been modified on the basis of input from

the Think Tank, and corresponding changes were made to the evolving profiling forms. Presenters at this conference developed the papers that they presented into chapters for a book that was peer reviewed by the conference steering committee and edited by the conference chairs into *Community-Based Employment Following Traumatic Brain Injury* (Thomas, Menz, & McAlees, 1993), which served as a key reference in subsequent training programs developed during the VAP validation process. As the demand for ongoing training conferences on the topic continued, the University of Wisconsin-Stout Research and Training Center developed the agenda for yet another national conference in co-sponsorship with the National Head Injury Foundation and the Mayo Clinic Outpatient Brain Injury Program in cooperation with the Midwest Regional Head Injury Center for Rehabilitation and Prevention.

## Table II-1. Problems Resulting from the Accident (Roush, 1989)

| Problem | Frequency | Percent | Importance of Information for Rehabilitation Planning: Somewhat Useful (%) | Vitally Important(%) |
|---|---|---|---|---|
| **PHYSICAL** | | | | |
| Balance | 23 | 60.5 | 10.5 | 76.3 |
| Lifting | 21 | 21.3 | 5.3 | 76.3 |
| Walking | 22 | 57.9 | 7.9 | 81.6 |
| Spinal cord injury | 2 | 5.3 | 5.3 | 73.7 |
| **SENSORY AND MOTOR** | | | | |
| Visual | 14 | 36.8 | 7.9 | 76.3 |
| Hearing | 4 | 10.5 | 5.3 | 73.7 |
| Pain Perception | 4 | 10.5 | 42.1 | 23.7 |
| Smell | 1 | 2.6 | 2.6 | 34.2 |
| Seizures | 14 | 36.8 | 5.3 | 73.7 |
| Taste | 1 | 2.6 | .0 | 36.8 |
| Coordination | 21 | 55.3 | 2.6 | 73.7 |
| **PSYCHOLOGICAL** | | | | |
| Memory | 35 | 92.1 | 2.6 | 94.7 |
| Writing | 21 | 55.3 | 28.9 | 47.4 |
| Attention | 28 | 73.7 | .0 | 92.1 |
| Organization and Planning | 35 | 92.1 | 5.3 | 86.8 |
| Communication -Receptive | 25 | 65.8 | 7.9 | 73.9 |
| Communication -Expressive | 25 | 65.8 | 5.3 | 81.6 |
| Visual-Spatial | 28 | 73.7 | 5.3 | 84.2 |
| **EXECUTIVE FUNCTIONS** | | | | |
| Unable to initiate motor acts | 9 | 23.7 | 2.6 | 76.3 |
| Planning/executing goal directed behaviors | 35 | 92.1 | 2.6 | 94.7 |
| Sequencing difficulties | 28 | 73.7 | 2.6 | 78.9 |
| Loss of self monitoring ability | 26 | 68.4 | 10.5 | 84.2 |
| Inability to analyze social situations and self adjust | 34 | 89.5 | 2.6 | 89.5 |
| **EMOTIONAL** | | | | |
| Alcohol or chemical dependency | 9 | 23.7 | 2.6 | 76.3 |
| Depression | 19 | 50.0 | .0 | 78.9 |
| Anxiety | 21 | 55.3 | .0 | 78.9 |
| Frustration | 34 | 89.5 | 2.6 | 86.8 |
| Anger | 25 | 65.8 | 2.6 | 76.3 |
| Paranoid or Suspicious | 7 | 18.4 | 18.4 | 57.9 |
| Auditory hallucinations | 2 | 5.3 | 26.3 | 47.4 |
| Behaviorally out of control | 16 | 42.1 | 2.6 | 73.7 |

# III. The Vocational Assessment Protocol

The information contained in the following section was taken from *The Vocational Assessment Protocol User's Manual* (Thomas, 1996). Details of suggested data collection methodologies and procedural aspects of administering the profiling instruments are not included in this summary. For full details of these processes and procedures please refer to *The Vocational Assessment Protocol User's Manual*.

## What is the Vocational Assessment Protocol?

The Vocational Assessment Protocol is a functional skills profile of vocational-related factors intended for use with persons who have acquired a traumatic brain injury. It was designed for use by persons familiar with both vocational rehabilitation of persons with traumatic brain injury and traditional vocational assessment strategies and approaches.

The purpose of the Vocational Assessment Protocol is to:

1. Systematically identify work skills, assets, and strengths upon which to focus vocational rehabilitation efforts.

2. Provide a structure and protocol for examination of the most frequent cognitive, physical, and psychosocial factors likely to affect employment and community integration for persons who have acquired a traumatic brain injury.

3. Define vocational rehabilitation strategies based upon minimizing vocational barriers through the development of compensatory techniques and use of creative problem-solving strategies.

4. Define vocational barriers in a common language and similar format for use by consumers and vocational rehabilitation providers.

## What the Vocational Assessment Protocol is Not

The Vocational Assessment Protocol is not an instrument designed for use as a yardstick for assessing whether or not a person is capable of entering and maintaining competitive employment. Although the functional skills, abilities, and traits assessed by this instrument tend to be predictors of employment success, the purpose of developing and validating this instrument was not to predict who will and who will not be successful, but to optimize employment and community integration outcomes for individuals who have suffered a traumatic brain injury by encouraging identification of assets and development of effective compensatory strategies.

The Vocational Assessment Protocol (VAP) presently exists in its final developmental state, having been validated on 149 subjects at 20 field sites throughout the United States. The Vocational Assessment Protocol is structured into profiles and rating scales, as well as data posting instruments that group information by its source, such as medical, neuropsychological, family information, etc. The structure of the Protocol is such that the information can be easily

gathered through similar sources. For example, all information obtained from the family would be found on Profiles A or B. The information regarding neuropsychological variables would be found on Profile E—Neuropsychological Profile, etc.

The Protocol discussed in this manual incorporates a standardized process used to gather the data. As with any standardized behavior rating instrument, it is recommended that the process, procedure, and Protocol described herein be used as closely and accurately as possible. It is anticipated that the Vocational Assessment Protocol will be used in a variety of situations and that portions of the Protocol may be used by one evaluator and not by another. Please note that any assumptions, generalizations, or predictions of the reliability and usefulness of this instrument have been made on the basis of using the entire instrument in the method described in this manual.

## Elements of the Vocational Assessment Protocol

The Vocational Assessment Protocol consists of nine structured rating instruments and a structural summary format designed to guide the vocational assessment process. The rating instruments include two structured interviews, three clinical rating instruments, and four measures of vocational adaptability. The Structural Summary is intended to assist the evaluator to condense the information into a meaningful summary of strengths, critical work behaviors, and potential work problems in relation to job goals. A format for addressing referral questions, appropriateness of job goals, supervisory and support recommendations, and additional service needs is also included in the Structural Summary.

Below is a summary of the instruments included in the Vocational Assessment Protocol (Thomas, 1994):

**Background Information Interviews (Profiles)**

A. Personal Demographic Questionnaire (PDQ)
B. Personal Demographic Interview (PDI)

**Clinical Rating Profiles**

C. Physical Profile
D. Social-Emotional Profile
E. Neuropsychological Profile

**Vocational Adaptivity Profiles**

F. Job Search Skills Profile
G. Interviewing Skills Profile
H. Critical Work Behaviors Profile
I. Social Adaptive Behaviors Profile

**Structural Summary Section (Optimal)**

This element of the Protocol is for use in synthesizing information. In this process, the evaluator is encouraged to:

- Detail strengths and problems found in Profiles A through I
- Summarize referral questions and address them
- Identify preferred learning styles and suggested teaching strategies
- Suggest behavior intervention strategies, supervision, and support needs
- Detail additional services suggested

## The 11-Step Process

An 11-step procedure was developed as part of the preservice training for instructing professionals as to suggested approaches for using the Vocational Assessment Protocol. Although this process may be modified and in many cases steps combined, the procedure appeared to have applicability at all 20 sites where the Vocational Assessment Protocol was field tested. These processes therefore appear to represent a good approach for getting started with the Protocol. Adaptation or tailoring of the Vocational Assessment Protocol for each particular setting may be necessary after experience with the entire Vocational Assessment Protocol. For example, people with more severe disabilities may be unable to complete Profiles F and G.

**Step 1. Gathering Background Information**

An essential part of the Vocational Assessment Protocol process is gathering and documenting background information. It is very important with any individual undergoing evaluation to document what is known about skills, abilities, and background characteristics, and it is critically important for persons who have sustained a traumatic brain injury. Profiles A and B were developed to provide a structure for collecting this information in a standardized, concise, and organized manner.

**Profile A—Personal Demographic Questionnaire**. The Personal Demographic Questionnaire (PDQ) is a survey designed for completion by a person with a head injury or someone who knows him/her well. The PDQ was designed to provide a comprehensive analysis of important accident and pre-accident information and perceived strengths, as well as perceived limitations and rehabilitation needs.

The Personal Demographic Questionnaire was derived in part from a research questionnaire developed by the University of Wisconsin-Stout Research and Training Center and the Wisconsin Department of Health and Social Services Task Force on Head Injury (Thomas, Czerlinsky, & Smigielski, 1987). This original questionnaire was developed using input from task force members. The task force consisted of head injury survivors, researchers, public policy officials, and a broad range of vocational rehabilitation personnel and head injury rehabilitation specialists. The *Wisconsin Survey of Traumatic Head Injuries: An Assessment of Rehabilitation Needs, and Social, Economic and Personal Loss* was completed by over 700 persons. Many of the items on the PDQ were derived either directly or indirectly from the

information gathered in this survey, which became known as the "Wisconsin Study," and a strong basis for normative comparison exists. The PDQ contains items found to be of primary interest in vocational re-entry and integration of persons with brain trauma injuries into the community.

The Personal Demographic Questionnaire is used to document information about a person's social, vocational, educational, and personal history from the aspect of the family or a significant other, and/or a person who has sustained a serious head injury. In some cases, this information may be available from other sources.

The PDQ provides a structured format for documenting history and relevant information typically requested by service providers. This format also provides a means of collecting a uniform set of data for research purposes. Depending on the circumstances, this information may be collected by having the person with a head injury or a significant other complete the Personal Demographic Questionnaire, which can later be reviewed by an interviewer for accuracy and completeness. If desired, an interviewer may also collect this information during a face-to-face interview.

During the completion of the Personal Demographic Questionnaire, information will be collected in following areas:

A. Information on Personal, Developmental, and Pre-injury Characteristics
   - Gender
   - Birthdate
   - Date of injury
   - Current marital status
   - Ethnic background
   - Current medication, dosage, and side effects
   - Early developmental history
   - Education completed

B. Employment History and Job Goals
   - Effects the brain injury may have on short-term and long-term earning potential
   - Pre-injury work skills or traits that may assist in obtaining and maintaining a job
   - Immediate and long-term job goals and alternatives

C. Current Living Arrangements and Sources of Support
   - Current living arrangements and special needs
   - Current sources of income and support

D. Causes and Consequences of Brain Injury
   - Type of brain injury
   - Cause of injury
   - Period of time unconscious or in coma
   - Length of amnesia period
   - Current problems that resulted from the head injury
     - Physical problems

- Sensory and motor problems
- Cognitive problems

- Severity of current or recurrent problems
  - Emotional related problems
  - Social and behavioral problems
- Other significant injuries accompanying this brain injury

E. Activities of Daily Living
- Self-care and hygiene
- Community survival skills
- Home living skills
- Accuracy of the data in this questionnaire

At the conclusion of the Personal Demographic Questionnaire, it may be determined that further clarification of the person's abilities in certain areas such as activities of daily living is necessary. Many rehabilitation programs already assess such issues in great depth but do not offer a concise summary of functioning. Most areas addressed on the PDQ provide only a sketch of functioning as opposed to detailed analysis. Evaluators are encouraged to examine any factors that may impact upon vocational or personal independence.

Gathering and posting this information will provide details of the person's pre-injury history, as well as the capabilities and skills that he/she possessed before the injury. Summarizing this information in a few paragraphs and keeping the Personal Demographic Questionnaire for later reference is suggested. Special attention should be given to Employment History and Job Goals since this was found to be another area that respondents had difficulties with in terms of providing accurate and detailed information. When completed in an accurate and thorough manner, job history can be examined and a transferable skill analysis can be initiated.

Following the completion of the Personal Demographic Questionnaire, the Personal Demographic Interview (PDI) can be completed. This can be done on the same day, or on a subsequent day. The order of completion of these two instruments is not as important as the fact that thorough and complete information is obtained. In some cases, the evaluator may find it more useful to complete Profile B prior to Profile A, especially if the completion of the PDI is an integral part of the intake process. The two measures assess different types of personal characteristics.

**Profile B—Personal Demographic Interview**. The Personal Demographic Interview (PDI) is a structured interview designed to assess a person's perceptions of changes in his/her behavior, as well as a comparison of significant others' responses to the same items. This procedure allows the interviewer to assess a person's self-appraisal in relation to another person's point of view and to identify potential problems insofar as variations in perceptions between the person with the head injury and his/her significant other.

The Personal Demographic Interview involves asking respondents a number of open-ended questions regarding characteristics such as ability to learn new information, memory,

emotional status, alcohol and drug abuse, etc. A three-point rating scale is used to document comments of both the significant other as well as the person with the head injury. A comment section is also available to provide additional information if necessary. This process was designed to examine attitudes and to process sensitive material in the give and take of a personal interview. Although numerical ratings are posted, it is the attitude and reaction of the interviewees that are the primary foci of this process. In some cases, this interview may be able to be completed in a few minutes, and in other cases it may take an extended period of time, perhaps up to an hour. The differences in time needed to complete this process will depend on the skills of the interviewer, the agreement that already exists between the person with the head injury and his/her significant other, and his/her ability to process this type of sensitive material.

The interviewer should be aware of the fact that this interview may be perceived as threatening, and at times counseling may be necessary to disarm any defensive attitudes that begin to emerge. With experience, the interviewer will be able to process this information in a sensitive and caring manner and should be able to gain insights into the nature of the opinions of both the person with a head injury and his/her significant other regarding changes and behaviors that either or both have noticed. The PDI compares the person's opinion of functional consequences of the injury to that of a reliable significant other in terms of:

- Learn and recall new information
- Prospective memory
- Ability to plan, carry out, and self-monitor activities
- Initiative to independently start and complete tasks
- Speed of thinking and responding and processing information
- Emotional status
- Sensitivity to light, noise, others, etc.
- Alcohol and drug use
- Social and interpersonal skills
- Emotional tolerance to stress
- Relationship to family members and close friends
- Physical and emotional endurance
- Physical skills necessary for work, play, and self-care
- Potential for job placement or return to a former job
- Pre-injury skills and ability as related to employment
- Hobbies and spare time activities related to work potential

**Sources of Additional Background Information**. In order to get a good idea of the nature of pre-injury characteristics and skills, it is often necessary to examine records and information from a variety of sources. Additional sources of such valuable information may include high school, college, and technical school records and transcripts; hospital treatment and discharge summary reports; therapist summary reports; neuropsychological evaluations; work history; and chronology of specific training, including military training and experience.

**Similarities and Differences in the Personal Demographic Questionnaire and Personal Demographic Interview**. The Personal Demographic Interview was designed to be used solely in a face-to-face interview. Both the Personal Demographic Questionnaire (Profile A) and the

Personal Demographic Interview (Profile B) will typically be completed by the same informant and reviewed by the same interviewer. Whereas the PDQ documents data from history as well as present problems, the Personal Demographic Interview will engage the person with a head injury (and a significant other as well) in a dialogue to discuss the effects of the head injury on day-to-day functioning and adaptive skills.

The information accumulated from both the Personal Demographic Questionnaire and the Personal Demographic Interview is not intended to take the place of diagnostic or evaluative reports, but rather to summarize the viewpoint of the person with the head injury and/or his/her family or significant other. The most difficult information for the person with the head injury or the family member to provide frequently are the data regarding accurate estimations of coma and post-traumatic amnesia periods (requested on Profile A—The Personal Demographic Questionnaire). The remainder of the information in both Profiles is typically easy to ascertain.

On both Profiles A and B, respondents are asked to provide information regarding their relationship with the person being rated, the date that information was collected, and the target job goal of the person. In some cases, this information is collected directly from the person with the head injury. Generally speaking, family members or significant others can readily supply the majority of all information requested.

Some of the evaluators in the pilot sample found it useful to present the Personal Demographic Questionnaire to the family member and have him/her return it later, while others found it necessary, in certain instances, to ask each question in the person's presence. When the family member is not available and the person must supply his/her own information, the data collected are also useful, although there is no comparison group for examination of the accuracy of self-appraisal, and in cases where individuals may not be accurate historians such information may be misleading. Typically the process of briefly reviewing the Personal Demographic Questionnaire with respondents and allowing them to complete it on their own time is the most efficient way to gather this information. It is useful to review the information that they provided in their presence, so information that otherwise would be inadvertently overlooked can be addressed. For some individuals, questions may need to be read to them. It is useful to train a paraprofessional aide, clerical worker, or intake assistant to administer the Personal Demographic Questionnaire and to respond to questions that respondents may have. This may involve explaining some of the esoteric terms described under cognitive or medical problems or other information such as what constitutes a coma or amnesia period as identified in Items 21 and 22. By contrast, the PDI should be completed in an interview and not given out to be completed independently. By having people respond spontaneously, the interviewer is more likely to solicit a more accurate and reliable opinion of both parties.

**Step 2. Profiling Clinical Background Information**

After securing background information and reviewing information essential for future planning, this information needs to be compiled into an efficient usable format. Initial research in this area suggested that even though detailed background information is available, if it is not in a format that is easy to use, it may not be used. Roush (1989) examined evaluators' opinions of the importance of background information such as physical and medical related data, sociologic and interpersonal skills, and neuropsychological variables. Of the various identified

traits and abilities as well as functional skills examined, the majority of all evaluators reported that this was very important information for an evaluator to have readily available prior to initiating a vocational assessment. When evaluators were subsequently asked whether or not these traits, abilities, or behaviors were characteristic of a particular individual in vocational evaluation, many were unable to respond. This research implies that although there is often voluminous background information, it is difficult to access and use when developing a vocational evaluation plan or when developing compensatory strategies.

Profiles C, D, and E were developed to help the evaluator compile this information into a readily available source of data. It is suggested that the second step in the assessment process includes the completion of Profiles C, D, and E. All three profiles described in this section group data into predetermined factors that were identified on the basis of the factors structure of the data collected as established in previous research.

**Profile C—Physical Profile**. The Physical Profile examines some of the common physical limitations encountered by persons who survive a significant brain trauma injury. This Profile provides a means of identifying specific problems with physical aspects of a person's functioning as well as an indication as to whether or not these perceived limitations may affect projected job goals.

The Physical Profile focuses upon issues related to the following physical functionings:

- Physical Capacity
  - Strength and stamina
  - Weakness/lifting limitations
  - Fatigability - endurance

- Movement Skills
  - Ambulation
  - Gross motor coordination
  - Facial muscle control
  - Range of motion/contractures
  - Paralysis/palsy

- Adroitness
  - Fine motor coordination
  - Dexterities (finger, manual, etc.)

- Sensory Perception
  - Pain perception
  - Numbness
  - Hot/cold/light touch sensation

- Sensory Systems
  - Vision system problems
  - Hearing (tinnitus, noise sensitivity)

- Smell and taste
- Balance/dizziness or vertigo
- Hemi-spatial neglect

- Chemical Abuse
  - Prescription drugs
  - Alcohol
  - Street drugs
  - Other chemical abuse

- Chronic Pain Issues
  - Back or neck
  - Headaches
  - General somatic complaints and fatigue
  - Other pain problems
  - Musculoskeletal problems

- Other Issues
  - Diabetes
  - Cardiovascular problems
  - Respiration/breathing
  - Skin conditions
  - Hydrocephalus/shunting
  - Swallowing
  - Heterotopic ossification
  - Awareness of body position in space
  - Epilepsy

**Profile D—Social-Emotional Profile**. The Social-Emotional Profile focuses upon issues regarding social adjustment, emotional stability, and other important variables in the person's interpersonal interactions with others in his or her environment. This profile provides a means of identifying the important characteristics associated with social interactions in a work environment. The Social-Emotional Profile was created to examine items found to be commonly related to difficulties on the job following a traumatic brain injury. Factors including social adjustment, emotional stability, activity level, chemical use, and intrusiveness in social situations are areas documented in this Profile. Factors profiled include the following:

- Social Adjustment
  - Age appropriate maturity
  - Concern for others
  - Acceptable activity level
  - Social appropriateness/common sense
  - Accuracy of self-appraisal

- Emotional Stability
  - Temper/explosiveness

- Anger expression
- Apathetic attitude
- Excessive complaints
- Tolerance of minor frustrations
- Appropriate emotions displayed

- Intrusiveness
  - Verbal aggressiveness
  - Physical intrusiveness/assaultiveness
  - Sexual appropriateness
  - Impulsive behavior or speech

- Activity Level
  - Spontaneity
  - Initiative to work
  - Isolation or withdrawal
  - Enthusiasm/drive
  - Appropriate activity level

- Suspected Chemical Use Problems
  - Prescription drug side effects
  - Alcohol related problems
  - Other substance abuse problems

**Profile E—Neuropsychological Profile**. The Neuropsychological Profile focuses upon aspects of neuropsychological functioning commonly identified as potential problems for persons who sustained a significant brain trauma injury. Broad areas of neuropsychological functions are addressed, with the capability of further elaboration of problems in specific content areas within each of several behavioral domains. A wide range of variables frequently addressed by a neuropsychological examination is included within this profile.

The Neuropsychological Profile is often completed by a neuropsychologist or rehabilitation psychologist with specific training in brain injury rehabilitation. This information may also be provided by an individual familiar with neuropsychological functions who has such information available to him/her through specialty reports and through direct observations during the course of vocational assessment.

Traits typically assessed during a neuropsychological evaluation are examined with this Profile as illustrated below:

- Freedom From Distractibility
  - Alertness
  - Vigilance
  - Attention and concentration
  - Mental calculation skills
  - Immediate verbal recall

- Intellectual Verbal Factors
  - General fund of information
  - Abstraction skills
  - Arithmetic reasoning
  - Vocabulary (word knowledge)
  - Common sense and social reasoning

- Intellectual Performance Factors
  - Visual organization skills
  - Perceptual organization and reasoning
  - Spatial relations - form perception
  - Attention to complex visual detail
  - Visual scanning skills

- Immediate and Delayed Memory
  - Auditory/verbal
  - Visual/nonverbal
  - Procedural/skill
  - Design or figure

- Other Memory Skills
  - Prospective (future)
  - Remote (historical)

- Communication Skills
  - Following verbal directions
  - Written expression
  - Goal directed speaking
  - Understandability of speech
  - Voice volume
  - Speaking vocabulary

- Psycho-Motor Skills
  - Simple assembly
  - Gross motor
  - Visual-perceptual-motor
  - Drawing and writing
  - Other fine motor skills

- Executive and Higher Order Skills
  - Planning and goal formation
  - Problem solving
  - Insightfulness
  - Decision making
  - Cognitive flexibility
  - Anticipation of problems
  - Self-regulation

- Self-awareness
- Information processing speed
- Awareness of limitation
- Judgment

- Other Cognitive Variables
  - Perseveration tendencies
  - Hemi-spatial neglect
  - Inattention (auditory, visual, tactile)
  - Tactile object and shape recognition
  - Mental flexibility
  - Stimulus bound behavior

- General Mental Health Issues
  - Confused thinking
  - Unusual content or form of thought
  - Self-centered or childlike behaviors
  - Disinhibition

- Affective Mental Health Issues
  - Depression, dysphoria
  - Anxiety or panic feelings
  - Emotionally lability
  - Manic, hyperactive, or hypomanic

- Psychotic Mental Health Issues
  - Auditory or visual hallucinations
  - Suspicious, guarded or paranoid behavior
  - Delusions or overvalued ideas

- Maladaptive Personality Variables
  - Antisocial tendencies
  - Pervasive behavior dyscontrol
  - Passive, obsessive, or compulsive features
  - Borderline or histrionic features
  - Other personality disturbances

Profiles C, D, and E are organized in a similar manner as described below. Each profile requests a person with a background and knowledge in each of the particular traits and factor areas to complete the profile in light of problem areas that may exist. A general rating is given as to whether or not a problem area appears to exist, as well as a job-specific problem rating, which assesses the particular areas identified against a specific job goal identified on the cover sheet. Raters are asked to provide general ratings for each area as to whether or not a behavior trait or functional skill (a) is within normal limits, (b) presents a minor problem, or (c) presents a notable problem. The rater is further asked to respond with a yes or no response as to whether or not a particular trait will also affect job performance on the specific job identified as the targeted goal on the face sheet.

**Ratings of General and Job Goal Related Traits**. Under the general rating, the three categories listed below are defined for purposes of identifying the nature and extent of the problems that appear to exist. For example, on the Physical Profile form, raters are instructed to provide a general rating for all eight physical trait categories listed starting with "physical capacity" and ending with "other issues." Raters are asked to provide a general rating of each category using the criteria listed below:

> **Within Normal Limits**. Problems rarely occur, are of no consequence, or have been corrected by use of an aid or appliance (e.g., glasses, hearing aid). If orthotic appliances or aids are used, comments are required.
>
> **Minor Problem.** Problems are evident that may affect vocational, social, or personal adjustment. Consequences that need to be addressed in a rehabilitation plan should be briefly described on the Intervention Strategies Worksheet.
>
> **Notable Problem.** Moderate to significant problems exist that are likely to affect vocational, social, or personal adjustment. These problems should be documented on the Intervention Strategies Worksheet.

The evaluator is requested to place a check mark next to each of the specific physical traits in the case that contributed to a rating determined as not within normal limits. In some cases, a rater may also wish to comment on specific items under each trait. Some raters prefer to identify each of the specific descriptors listed under each trait as being within normal limits, having a minor problem, or notable problem. For example, on the Physical Profile form, under the general category of physical capacity, some raters may wish to list strength and stamina as within normal limits, whereas they may wish to identify a weakness or lifting limitation as being a notable problem, with a comment that because of back problems a lifting limit of 25 pounds is recommended. If the targeted job goal does not require lifting of this nature, the job specific problem category may be rated as "no" (problem), indicating that no specific problem on that job is anticipated.

**Identifying Strengths and Assets**. On Profiles C, D, and E, variables that may serve as relative strengths or assets should also be identified. After completing each profile, the rater is asked to go back through the list of the traits listed in bold that are preceded by a number (for example under physical traits, physical capacity, movement skills, etc.) and place an "S" before any variable that may be viewed as a strength or asset for consideration in vocational planning. These areas of relative strengths or assets should also be identified on the Intervention Strategies Worksheet that is at the end of Profiles C, D, and E. Evaluators are asked to elaborate on strengths and suggest how they may be used to compensate for problems, or how any particular strength area could be highlighted when discussing this individual with employers. The comment section of each profile is probably the most important portion of the profiling form, since this will identify and detail specific functional limitations or assets that may affect a person's job goals and general work productivity.

The final section for Profiles C, D, and E includes an Intervention Strategies Worksheet on the last page of each profile. Evaluators are asked to list any areas that were identified as

a minor or notable problem and are advised to describe the potential impact of the problem on a targeted job goal or work in general. Specific compensatory strategies to minimize negative effects are also asked to be detailed. When Profiles C, D, and E are being completed, the problem areas and strengths should be readily identified, and the impact on potential jobs should be able to be estimated. Sometimes, it is necessary to go to other sources to identify strategies to minimize negative effects and develop compensatory strategies. Team meetings and feedback sessions often can add insights to compensatory strategies that may be of value. In any case, strategies that are suggested should be thoroughly explored to determine feasibility.

The evaluator should offer concrete suggestions and interventions likely to work rather than "pie in the sky" solutions to problem areas. Suggestions should be as specific as possible and not generic. General comments such as "refer to work adjustment training to address problems in the area of verbal aggressiveness or physical intrusiveness" are not specific enough. Whenever possible, identification of specific interventions likely to be effective with an individual should be suggested. If the evaluator has been unable to identify specific interventions or compensatory strategies, other available resources should be considered. For example, referral to an applied behavior analyst to identify strategies for dealing with problems associated with social intrusiveness may be a means of developing a specific behavioral program when the evaluator is at a loss for identifying specific behavior intervention strategies.

**Step 3. Intake and Assessment Planning**

The intake interview should be completed at the time that information for Profiles A and B is collected. It may be necessary to complete the Profiles before or after the interview depending on the nature of the specific program structure. In the course of intake planning, it is wise to obtain a working commitment from the person referred for vocational assessment and to have that person identify the purpose of the vocational assessment. If an evaluation referral is unable to identify a reason to complete the assessment or is unwilling to make a commitment to follow through with the assessment, the evaluator is placed in a difficult position of planning an assessment for an individual who may be unmotivated, uncooperative, or unwilling to participate at all. See Thomas (1990, p. 114) for further details of suggestions for obtaining working commitments and gaining behavioral compliance in vocational assessment. Actively involving the person in all phases of decision making during the evaluation should not add time or effort on the part of the evaluator but requires flexibility on both sides.

**Step 4. Formalize and Operationalize Referral Questions**

At the time of a referral, many evaluators find it useful to identify specific questions to address during the course of a vocational evaluation. When using the Vocational Assessment Protocol it is suggested that the evaluator specify such questions at the onset of an assessment and develop a prescriptive approach to address referral questions. During the course of the validation of the Vocational Assessment Protocol, it was found that revisiting the referral questions is important at some point before the evaluation is completed. For example, a referral question may be stated in a general sense such as "Does this person have the ability to return to a specific job?" or "Can you identify compensatory strategies and rehabilitation needs prior to a return to work?" After completing a background information review and completing Profiles A through E, it may be apparent that the referral questions need to be rephrased.

Operationalizing the referral question in a manner that is as specific as possible will allow the evaluator to be more prescriptive in the manner that the evaluation process is designed. For example, a question from the referral source may be simply "Can John work competitively?" After reviewing background information and speaking with John, the evaluator may learn that he has a 15-year work history at the same company, which is willing to try him at his former job. The evaluator may wish to operationalize the referral question in conjunction with the referral source to read "Can John return to his former job as a punch machine operator at ABC Company, working 40 hours per week? If so, what job modifications or compensatory strategies may make a transition back to this job be more efficient?"

**Step 5. The Intake Interview**

During the intake interview, it is suggested that the evaluator develop an assessment hypothesis to determine the type of evaluation that will be pursued. Typically, when an evaluation unit is established to begin to assess persons with traumatic brain injury, a wide range of referrals including individuals with a minimal functional disability and those with severe and pervasive problems will be received. For this reason, it is important for evaluators to consider various types of assessments that may be necessary based upon referral questions and existing functional limitations.

The following types of prevocational assessments are suggested for consideration for use with persons who have sustained a traumatic brain injury. This listing is offered as a means of conceptualizing a type of assessment that may be required for any individual, and any one vocational assessment may include one or more of the following:

1. **Formalized testing**. Includes neuropsychological testing and specific vocational testing of achievement, aptitude, and vocational interests.

2. **Traits and abilities testing**. Includes dexterity tests and work samples that attempt to examine a particular factor or trait such as gross motor coordination or fine assembly skills.

3. **Safety evaluation**. An assessment of one's safety awareness and ability to work safely around machinery or hazardous materials. A safety evaluation, if needed, should be conducted in a simulated situation prior to placement on a job.

4. **Behavioral assessment**. An assessment of interactions with other workers and documentation of behaviors that may interfere with social adaptation or on-the-job functioning.

5. **Environment analysis**. A job analysis and a content task analysis of specific duties are usually performed. An appraisal of co-workers' behaviors and the immediate work environment is essential to consider to determine how the person will fit in with the existing environment.

6. **Functional assessment**. A description of a person's ability to perform the basic

skills necessary for community integration. Factors assessed include an appraisal of social interactions, use of public transportation, and the ability to adapt to changing environments. This may include an assessment of a person's ability to access toilet facilities, obtain food, and secure medical help if necessary.

**Step 6. Initiating the Evaluation**

It is suggested that, when initiating the vocational assessment while using the Vocational Assessment Protocol, a controlled situation such as a vocational evaluation laboratory be used at the onset to assess traits such as behavioral skills and interpersonal relations, dexterity and motion skills, activities of daily living, achievement, aptitude, and motor skill related abilities. This is suggested particularly for people with significant functional limitations secondary to brain trauma injuries. Most vocational evaluation programs provide for such an environment, while some have adopted total community-based assessment approaches, which make it more difficult for dealing with individuals who have an acquired brain injury and numerous functional limitations and problem areas. Getting to know the person in a structured setting such as a vocational evaluation laboratory will help to anticipate safety problems, learning style, and interpersonal skills in a controlled environment. This will provide a good starting point from which to build further assessment strategies for the remainder of the evaluation.

**Step 7. Identifying Vocational Interests and Work Needs**

Near the beginning of the vocational evaluation, the exploration of vocational interests and work needs is an important consideration. Although the Vocational Assessment Protocol does not provide for a means of conducting vocational interest testing and work needs assessment, it requires that individuals identify specific vocational goals and encourages the development of alternative job goals, both long- and short-term. Vocational interest measures are useful for identifying areas of potential vocational involvement if specific vocational goals are not specified.

**Defining Work Interests**. When a person is undecided about vocational goals and vocational interest testing is not productive, it may be wise to use other means of exploring interest patterns, including examining hobbies and interests and past work histories. Encouraging the perusal of a Sunday newspaper want ad section is suggested in order to determine which specific jobs listed are of interest, to explore what the person finds important in a job, and to ask what about a given job is attractive to him/her. Asking an individual to go through a large metropolitan Sunday newspaper and to circle jobs of interest solidifies knowledge of jobs available in the community and allows him/her to explore the traits, behaviors, and skills required for specific jobs.

**Occupational Exploration**. Occupational exploration is often a valuable process for persons who have had limited vocational experience, as may be the case with young persons who are brain injured. One method of expanding knowledge of work is job shadowing. By asking the client to follow a person who is working at a particular job he/she is interested in for short periods of time, perhaps two half days, first-hand knowledge of job demands can be examined. Encouraging individuals to participate in informational interviews of persons working in jobs

they consider as desirable and of interest to them is a way to spark the interest of persons who lack vocational direction. Certainly some reality counseling may be necessary depending on the loftiness of one's vocational goals, as may be the case with any young and unexperienced individual wishing to enter the labor market.

**Vocational Counseling**. Vocational counseling is an essential part of any vocational evaluation. The results of initial testing can be reviewed and discussed; job goals and alternatives can be addressed and other issues explored as a focal point of the vocational assessment process. At this point in time, the vocational decision-making process can be broadened and persons can be asked to define what they feel are important job delimiters. Job delimiters, as described by Thomas (1988), include such factors as the minimum wage that a person is willing to accept; the benefits he/she will need in a particular job; and the working hours, location, and any other factors that may limit the availability of jobs in a particular area. Certainly the individual who only wants to work in a hospital setting during day time hours with weekends off and with full benefits for $10 an hour will be more limited than the one who does not set as many restrictions or delimiters insofar as workplace, type, salary range, etc. Setting delimiters does not necessarily limit the employability of the individual or his/her capacity to secure specific employment. It can, however, give the vocational specialist ideas of what the person would like to see in an ideal job and can foster discussions as to what may be expected on an initial job placement or return-to-work trial.

**Step 8. Situational Assessment and Job Search**

Since the functional skills profiles included in Profiles F through I require observations in a number of structured and simulated situations, it is important to begin planning for these arrangements early in the vocational assessment process. When immediate and long-term vocational goals have been identified, potential assessment sites in controlled situations can be defined and organized, and community-based assessment or work trial sites can be explored.

**Profile F—Job Search Skills Profile**. The Job Search Skills Profile (JSSP) assesses variables identified as critical to independent job seeking success. Information of this nature is typically gathered either through direct observation or from a structured interview that focuses upon each of the critical factors examined by this Profile.

The Job Search Skills Profile employs a means of examining job search skills, originally developed for use with the Vocational Adaptivity Scale (VAS). See Thomas (1983 & 1988) for full details. In the present version of the Vocational Assessment Protocol, the interviews and methods of collecting this information include the process and procedure described below. The Job Search Skills Profile allows the evaluator to assess whether the examinee:

- Identifies reasonably obtainable job goals
- Is able to produce typed letters for employment search
- Demonstrates knowledge of how to make initial employer contacts
- Demonstrates knowledge of how to comprehensively canvass the community to search for employment
- Is able to track job leads and employer contacts for follow-up

- Plans on spending an adequate and consistent effort in searching for employment
- Is able to provide the names, addresses, and phone numbers of personal and work references
- References can support the fact that the person possesses the skills and abilities to perform targeted job goals upon request
- Can describe disability or limitations in a functional and nonstigmitizing manner
- Has access to reliable transportation to interviews and work

The Job Search Skills Profile is designed to provide a structured approach to evaluating a person's knowledge of information considered essential to conducting an effective job search. The Job Search Skills Profile can be modified if necessary to help guide the interview with each person. With an interviewer's experience, ratings can be completed during the interview; however, the interviewer may find it more convenient to complete the ratings immediately after the interview is concluded. The purpose of this assessment is to evaluate the person's knowledge of only job search skills. Job interviewing skills are examined in a subsequent profile.

**Profile G—Interviewing Skills Profile**. This section of the Vocational Assessment Protocol includes 16 variables related to a person's ability to interview for employment. Social-adaptive and interpersonal relationship skills are examined, through direct observation or through mock or real job interviews. Below are the skills and behaviors assessed using this profile:

- Uses telephone to inquire about jobs
- Uses appropriate telephone demeanor and language
- Arrives on time, presents self adequately, and waits appropriately before the interview
- Has a well organized, neatly typed resume that reflects previous training and work experience
- Can independently fill out job application neatly and completely
- Enters the interview appropriately and demonstrates good initial impression
- Demonstrates an assertive and purposeful personal approach (e.g., eye contact, firm handshake) without being overbearing
- Expresses a general knowledge of the job and the company in which employment is sought
- Positively relates background, training, and/or work experience as a qualification for the intended job
- Avoids making negative remarks about present or former employers
- Answers open-ended general questions
- Explains employment difficulties appropriately (e.g., past employment problems or gaps in employment history)
- Deals with sensitive material or problem areas in a positive, constructive manner
- Can appropriately request information on wages and benefits
- Has the ability to keep pace and place in the interview
- Demonstrates courtesy and thanks the interviewer(s)

The Interviewing Skills Profile (ISP) was developed to assess a person's ability to participate in the give and take of a job interview.

**Step 9. Situational Assessment and Job Retention**

Step 9 requires the examinee to be placed in a real work situation, either in a supervised or sheltered area or on an actual community-based work site. It is suggested that the information included on both Profiles H and I be first observed in a controlled situation, which may involve placement in a work trial in a community-based rehabilitation center, vocational training program, or at a volunteer work site. By observing the behaviors on both of these profiles in controlled situations, a better means of preparing for a community work site situational assessment or work trial can be established.

**Profile H—Critical Work Behavior Profile**. The Critical Work Behavior Profile assesses general work skills, supervisory relations, social adaptive behaviors, and basic skills required in a variety of jobs in the competitive labor market.

The Critical Work Behavior Profile was developed from items included in the Vocational Adaptivity Scale as a means of identifying those behaviors commonly observed by work supervisors that are known to be predictors of a person's ability to maintain employment in the community-based work force. This portion of the Protocol requires no additional resources for use, but the user is advised to see the directions in the Employment Readiness Assessment manual (Thomas & McCray, 1988). Below is a listing of the behaviors assessed with this Profile:

- Follows shop rules and regulations, including safety
- Quality of work
- Demonstrates knowledge of job
- Remembers work instructions
- Work productivity and work pace
- Dexterity in relation to desired job goal
- Follows through on work tasks to completion
- Punctuality at start of work and after breaks
- Attends work daily and calls with reasonable excuse for absences
- Demonstrates a practical approach to solving work problems
- Organization of work and related materials
- Looks for things to do to keep busy during slow times
- Potential to advance on the job and assume new responsibilities
- Requests assistance when needed
- Skill development in relation to job demands
- Work stamina
- Displays an appropriate awareness of surroundings and activities in the immediate vicinity
- Expresses self clearly and efficiently
- Displays the ability to be appropriately assertive and stand up for oneself
- Exhibits enthusiasm appropriately giving the impression of being motivated to work
- Demonstrates adequate grooming and hygiene
- Delays immediate desires in order to work for longer term goals

- Demonstrates a desire and/or need to work
- Reads instructions, memos, etc.
- Performs simple math on the job such as counting, estimating, solving simple problems, measuring, etc.
- Has a network of friends, relatives, and other contacts to assist in locating work and provide necessary support
- Follows supervisor's work instructions accurately
- Works independent of the supervisor after an initial training period

Both the Critical Work Behavior Profile (Profile H) and the Social Adaptive Behavior Profile (Profile I) should be used by work supervisors to provide impressions of the person's work functioning from the supervisor's perspective. A minimum of two raters should be used in this portion of the assessment. This may involve both

1. An in-house assessment using known supervisor's or instructor's comments.

2. A community-based assessment using a work site in a competitive work situation for which the person is paid a wage.

Work supervisors, whether in-house or in the community, should provide the ratings whenever possible. Comparisons can be made between different raters to arrive at a composite or overall rating. For example, ratings based on performance from the in-house work site may be substantially different from those ratings provided by employers at work sites in the community. In some cases, a work supervisor may be unable to provide a rating to certain items and a case manager or other professional may need to complete the ratings.

**Profile I—Social Adaptive Behavior Profile.** Similar to the Critical Work Behavior Profile, the Social Adaptive Behavior Profile may also be completed by a work supervisor or by the vocational evaluator or other rehabilitation professional. As with the Critical Work Behavior Profile, two individuals should be solicited to rate the examinee on each item, with the vocational evaluator being the final determiner of how each behavior will be rated and which of the behaviors appear to be within normal limits or which have a problem of either notable or minor proportions. A list of the behaviors assessed with this profile are appears below:

- Refrains from complaining about co-workers, supervisors, or work tasks
- Cooperates with supervisors
- Establishes appropriate relationships with supervisors
- Profits from instruction or criticism
- Demonstrates courtesy to other workers
- Maintains proper posture and distance from others during conversations
- Demonstrates appropriate volume of voice
- Displays appropriate expression of emotion
- Displays acceptable morals and ethics on the job
- Is accepted by co-workers
- Maintains a realistic opinion of achievements and abilities
- Handles minor work stress and frustrations on the job

- Demonstrates swings in mood or unpredictable behavior
- Boldness presents a problem in social situations
- Refrains from making others feel uncomfortable because of actions, physical appearance, or general conduct (e.g., inappropriate body movement, staring)
- Demonstrates an awareness and sensitivity to the feelings of others (e.g., knows when to end a conversation, when not to disturb others)
- Cooperates with co-workers
- Refrains from making others uncomfortable by awkward comments or out of context, inappropriate remarks
- Displays facial expression appropriate to the situation
- Distracts or disturbs others at work
- Offers acceptable excuses for inappropriate behaviors if necessary
- Views outcome of events as controllable and determined by actions on the job (e.g., effort expended or skills rather than merely luck)
- Attitudes of family or parents interfere with employment efforts

Research with the Vocational Assessment Protocol has found that individual raters may vary greatly when rating the same person in the same job. It was also found that agreement between raters can be improved dramatically by asking both raters to review their ratings of a person with another independent rater. If the raters are observing a person in different work settings, differences between raters may well reflect differences in behaviors rather than rater bias. In the Vocational Assessment Protocol validation study, it was not uncommon to hear evaluators report that they observed wide variations in behaviors when different types of work sites were used, as a function of type of work performed, environment, attitude towards co-workers and supervisors, and numerous other reasons.

To ensure that the most accurate and reliable ratings are being obtained, the following steps should be followed:

1. Each supervisor should be informed as to the nature and purpose of the evaluation and instructed to rate the person on each item in relation to job performance during the evaluation period. Supervisors should be provided with a copy of both Profiles H and I before the assessment begins.

2. Ratings should be completed at the end of a predetermined evaluation period. It is important to conduct an in-person interview with the supervisor to briefly discuss the ratings, answer questions, and to obtain anecdotal information that may not appear on the rating form.

3. Repeat steps 1 and 2 with each supervisor who provides a rating.

4. Inspect each rating form to ensure that a response is made for each item. If the rater was unable to provide a response to any of the items, the person responsible for completing the Profiles will be responsible for providing his/her "best guess" to these items. This may involve arranging a situation that will allow the evaluator to observe the behavior described in each item not rated.

5. Review all ratings and comments and transfer ratings and pertinent comments to a composite or overall rating.

Before the Critical Work Behavior Profile has been completed, it is suggested that the ratings of the behaviors be reviewed with the client, identifying two positive behaviors followed by any one of the problem areas listed.

**Step 10. Community-Based Job Trials**

Following completion of a situational assessment in a controlled situation, it is advised that a community-based job trial be undertaken in one or more areas during the course of the vocational assessment. After the individual has received feedback regarding work behaviors and has had the opportunity to discuss this in a counseling session with the vocational evaluator, the community-based job trial can be planned. During the community-based job trial, several types of options are available. First, a continuation of the situational assessment that had been done previously in a community-based situation may be extended for a longer period of time, perhaps one to two weeks if necessary. This will allow the evaluator to have an extended opportunity to observe behaviors on the work site.

A second option would involve a separate individual placement with or without a job coach or other supports. Following the situational assessment, the person may be returned with support to his or her former employment or preferably in a situation akin to the type of work that was done in the past. Experience with the Vocational Assessment Protocol suggests that sometimes it is best to allow the person to make mistakes and refine skills before going to the job that is targeted as the primary job goal. With this strategy, work behaviors can be improved, speed increased, efficiency optimized, and the person brought closer to his/her optimal level of functioning prior to the time that the intended employer has the opportunity to view the person on the job.

A group work placement is a third option that can be used with persons who require a more structured situation or close supervision. In this approach, the individual undergoing assessment may be placed at a job site in which two or three other employees also are performing the same or similar functions within the same organization. Typically this includes a supervisor at the work site who is readily available to provide assistance, supervision, and intervention as necessary.

A fourth and more restrictive type of community-based placement involves enclave employment. In this type of arrangement, persons with disabilities work alongside other persons with disabilities in a community-based work situation, but typically the workers and the supervisor are separate from the main company workers and supervisors. Separate work space is often arranged and the supervisors for other employees within the company typically do not interact with those in the protected or enclave work environment. For more detailed information on these types of approaches, see Botterbusch (1989) or Coker (1992).

**Step 11. Develop the Evaluation Report and Complete a Structural Summary**

Completion of the Structural Summary will engage the evaluator in a process that will

address issues of concern for the individual being rated. Input from a variety of sources will be used to address referral questions and concerns. Development of a list of service needs to consider following the vocational assessment process should also be done at this time. This portion of the Vocational Assessment Protocol is included primarily for clinical use and may or may not be used on a consistent basis with all referrals. The Structural Summary report represents a means of collapsing data from all the profiles into a condensed format that includes descriptions of all identified problems as well as strategies to minimize, compensate for, or modify work tasks in order to minimize the impact of problem areas. Relative strengths and assets should be used in compensatory strategy development.

A summary of preferred learning style, preferred instructional methods, and possible behavior intervention strategies should be detailed. A list of evaluation questions is identified in the "Referral Questions Summary"; the first four are general considerations around that the Vocational Assessment Protocol is oriented while the fifth question represents important questions to be addressed during the course of vocational assessment which may have been developed on a case specific basis at the time of referral. The "Vocational Service Needs Inventory" is designed primarily for use as a means of identifying which additional service needs may need to be addressed. The purpose of this entire summary section entitled the "Structural Summary" is to provide an overview of the basic traits and behaviors assessed using the Vocational Assessment Protocol.

# IV. Research and Development Results

This research was conducted with the sponsorship of the Midwest Regional Head Injury Center for Rehabilitation and Prevention (MRHICRP) at the Rehabilitation Institute of Chicago (RIC) and the Rehabilitation Research and Training Center at the University of Wisconsin-Stout (UW-Stout RRTC). Its development preceded the current project, but the combination of funding from MRHICRP and UW-Stout RRTC and the involvement of many individuals and organizations through this project allowed completion of a complex model development, field demonstration, and research effort. Providers, consumers, and practitioners from across the United States were involved in virtually every phase of the Vocational Assessment Protocol's development, piloting, and validation. This section presents a summary of the procedures used to conduct the research and the efforts to establish a reliable and valid methodology for integrating information relevant in vocational rehabilitation planning with persons having traumatic brain injuries.

## Scope of Methodologies

The Vocational Assessment Protocol (VAP) does not conform to a typical test where total scores and part scores have statistical meaning or diagnostic inference. As a Protocol, the variables or factors included in each of the profiling tools (as opposed to items in the traditional sense) are not expected to be "added-up" for an individual. Instead, the variables represent functional problems frequently experienced by individuals with brain injuries. The VAP can be used to profile areas where the individual may exhibit behaviors or attributes that may limit their achievement of an identified vocational goal, as well as to profile strengths and assets to compensate for or offset such barriers.

Theoretically, norms, reliability, and validity would have to be established for every variable included in the VAP. This daunting possibility led to the incorporation of a variety of processes that would ensure (a) the right content was included, (b) redundancy and overlap could be minimized without diminishing meaning, (c) variables would be presented in sets that made clinical sense, (d) data would come from a reliable source, (e) internal consistency would be maximized where appropriate, (f) personnel with appropriate clinical experience would complete each profile with the individual, and (g) specialized training would be provided to ensure the evaluators completing the total VAP were qualified in gathering, compiling, and utilizing the synthesized information in individualized planning. Therefore, several approaches to "estimating" reliability and validity were employed in the VAP's development. The procedural and statistical efforts used to optimize reliability and validity included the following:

- Use of prior research of the senior author in constructing and validating the Vocational Adaptivity Scale (VAS), which was adapted and incorporated into several of the current profiles;

- Input gathered in the Atlanta Think Tank on medical, psycho-social, and vocational issues considered important to the vocational rehabilitation of persons with brain injury was incorporated into the VAP;

- Systematic reviews were conducted of the initial lists of potential items drawn from the literature and used for selection of instruments and construction of instrumentation by experts in neuropsychology and rehabilitation, as parts of national conferences on vocational rehabilitation sponsored by the Research and Training Center (i.e., Clearwater Beach, 1989, Philadelphia, 1991);

- Ongoing guidance was provided by a six-person professionally-based Project Steering Committee (Dale Thomas, Thomas Hammeke, Daniel Keating, James Malec, Fredrick Menz, Mitchell Rosenthal);

- Periodic reviews and critiques were provided by the Vocational Advisory Committee of the MRHICRP at RIC, by the Center's National Advisory Council, and by consumers participating in the instrument's development and experimentation;

- Formal training was provided to every user of the VAP during all phases of the research;

- Field trials and structured feedback on various versions of the VAP were gathered by vocational rehabilitation counselors in New England, evaluators in California (only with the Vocational Adaptivity Scale), the six pilot sites in Region V, and the 17 nationally distributed sites used in validation of the current version of the VAP;

- Clinical interviewers estimated the validity of interviewee responses in structured interviewing;

- Factor analyses and internal consistency estimates were computed with data from the initial samples and the much longer version of the VAP;

- Internal consistency estimates and statistical profiles of characteristics, attributes, and problems were computed from data obtained on the 149 individuals reported herein;

- Broader review, input, and synthesis were obtained during the 1995 Summer Training Institute conducted at the University of Wisconsin-Stout in Menomonie, Wisconsin; and

- Follow-up of the 149 individuals to gather employment data with which to estimate predictive validity of the VAP and variables (is underway, but not reported herein).

## The Pilot Study

### Pilot Sites

The pilot study attempted to examine the overall structure, reliability, and utility of the proposed Vocational Assessment Protocol. A field test was designed to collect data on the various instruments included in the VAP through a collaborative research and training effort initiated with the MRHICRP. The six sites were located in Region V, one in each state, to obtain relative diversity among state delivery systems for piloting the VAP. Sites were selected by staff of the Region V traumatic brain injury center at the Rehabilitation Institute of Chicago and the Research and Training Center based upon applications, site visits, and capacity of sites to provide completed profiles on a minimum of three individuals within a 6-month period. The pilot sites were the following:

| | |
|---|---|
| Curative Rehabilitation Center | Milwaukee, WI |
| Direct Connections | St. Cloud, MN |
| Jewish Vocational Services | Cincinnati, OH |
| Peckham Vocational Industries | Lansing, MI |
| Pioneer Center | McHenry, IL |
| Trade Winds Rehabilitation Center | Gary, IN |

### Site Development and Training

Following selection, each site was visited to provide consultation on evaluation of consumers with brain injury, on program design, and to orient participating staff in procedures with the pilot version of the VAP. The participating staff from the sites were provided two separate training experiences.

The first training session was provided before any VAPs were completed. A 2-day training program for vocational evaluators, rehabilitation counselors, and case managers was convened at MRHICRP in Chicago in July of 1992. All individuals attending the training program were trained in the use of the VAP. The 2-day training program provided general training in vocational evaluation procedures for persons with traumatic brain injury, introduced the various data collection devices, and trained each participant in the use of the instruments and procedures for collating and synthesizing information. Over the course of the following 12 months, persons referred to their program for brain injury services were profiled on these forms. Subsequently, each site was required to collect complete information on at least two consecutive referrals of persons with traumatic brain injury to their facility.

The second training program occurred in August, 1993, after sites had completed the requisite VAPs. They received more extensive training on brain injury issues, on use of the information for planning purposes, on additional emerging topics relative to brain injury (e.g., substance abuse), and on how to collect appropriate information and how to synthesize and incorporate their findings in rehabilitation planning. Interim monitoring was provided to respond to concerns, or problems, and to encourage thorough and accurate completions of VAPs. An important function of the second training program was to monitor progress, obtain feedback on

procedures, review problems encountered in collecting data, and review problems with assessment of the perspectives that individuals had regarding use of the instruments. This input, combined with formal data analyses, provided guidance to restructure and reduce the overall size of the VAP and to devise practical procedures for using the revised VAP.

**Pilot Version and Consequent Revisions**

In 1992 and 1993, the VAP contained five basic elements including the Family Interview and Background Information Questionnaire of Traumatic Brain Injury Survivors, Functional Assessment Inventory, Vocational Adaptivity Scale, Performance Profiling Forms, and Program Path and Evaluation Strategy Form.

**The Family Interview and Background Information Questionnaire of Traumatic Brain Injury Survivors.** This instrument was a modification of a survey questionnaire developed by the University of Wisconsin-Stout and the Wisconsin Department of Social Services (Thomas, Czerlinsky, & Smigielski, 1987) to identify common problems and consequences of traumatic brain injury. The questionnaire was developed by a consensus task force consisting of head injury survivors, researchers, public policy officials, and a broad range of vocational rehabilitation and head injury rehabilitation specialists. Comparative data were collected on over 700 persons. All items therefore had a strong base of normative information for comparison purposes. The Family Interview and Background Information Questionnaire allows an examiner to collect and code information critical for planning vocational re-entry and social integration services for persons with traumatic brain injury, from the perspective of the individual with the injury. The first section collected personal history and injury information and the second provided opportunities for the individual and a significant other to provide personal perceptions of the impact of the injury on behaviors. This questionnaire was extensively revised and the first section became Profile A—Personal Demographic Questionnaire and the second section became Profile B—Personal Demographic Interview after the pilot study and input from clinical experience.

**The Functional Assessment Inventory.** The Functional Assessment Inventory was developed at the University of Minnesota (Crew & Athelstan, 1981) and published by the Materials Development Center at the University of Wisconsin-Stout. Extensive studies with various populations of persons with disabilities in Wisconsin and Minnesota had been conducted and these normative data allow the examiner to determine the relationship between current levels of functional skills in areas such as vision, hearing, use of hands, and endurance and availability for work and stability of disabling conditions. Thirty items related to work and functional skills are included in this scale as well as 10 items identifying special strengths. This inventory was not retained in the final version of the VAP because content was found to be redundant with information contained in other profiles, and staff at the pilot sites reported that it provided limited additional information.

**The Vocational Adaptivity Scale**. The Scales were originally developed by Thomas in 1983 and revised in 1988 (Thomas, 1988). The Scales consist of 78 items in four sections, designed to permit a comprehensive assessment of a person's ability to independently search for employment, participate in a job interview, and maintain a job by displaying appropriate work

related behaviors. The first section involves assessment of a person during role playing of a structured interview to determine if a person has the knowledge of job-seeking behaviors and displays his/her capacity to conduct an independent job search (e.g., resumes, interview, telephoning, follow-up). The second section uses feedback from supervisors or job coaches to rate the person's work related skills and responsiveness to supervision, along with social adaptive skills such as ability to interact with others at breaks, capacity to profit from criticism, and ability to interact with work supervisors. The final sections summarize strengths and weaknesses, estimate the appropriateness of job goals, and direct evaluators to offer suggestions for remediation or correction of behaviors likely to interfere with job performance. Factor analyses yielded four specific vocational profiles: F—Job Search Skills (10 skills), G—Interviewing Skills (16 skill items), H—Critical Work Behaviors (28 behavioral items), and I—Social Adaptive Behaviors (24 behaviors). The synthesizing activities became part of the Vocational Needs Inventory.

**The Performance Profiling Forms.** The Performance Profiling Forms (Thomas, 1990) were developed as a means of profiling data in functional terms using information frequently available in neuropsychological, medical, and social work reports. The forms were intended to provide a way to extract significant information from various information sources that would be relevant to the individual's needs for interventions and that would identify remediations or compensatory strategies that would foster vocational and community integration. After the rehabilitation counselor gathered information from various sources and a job goal was identified, the counselor could determine whether or not deficits or problem areas could likely cause difficulties in achieving the identified vocational pursuits. Areas that identified as problematic were targeted for future attention. By changing the job, changing the person, or changing the job goal, barriers to employment were expected to be manipulated so that employment adaptability was maximized. Multiple ratings were required for each item on the profiles in the original form.

The **Physical Variables Profile** includes medical related information supplied by a medical examiner, rehabilitation nurse, or case manager who is thoroughly familiar with the person's medical status. Information such as ratings of visual system problems, hearing difficulties, noise sensitivity, reaction to pressure, pain, or cold sensations are recorded. In total, 26 items are included in this profiling form.

The **Neuropsychological Variables Profile** is similar to the Physical Variables Profile, but seeks information specific to neuropsychological status. It contains 31 items in several areas such as general cognitive functions that include abstraction skills, insight into current disability, and cognitive flexibility.

The **Social-Emotional Variables Profile** is typically completed by a case manager, social worker, or a person who knows the individual well. This scale includes 28 items. Social adjustment characteristics such as concern for others, general maturity, social common sense, and similar items are among the functional skills, abilities, and behaviors rated. Daily living skills items such as self-care, medical self-care, and safety awareness are included as well.

Factor analyses of each of the three forms yielded more concise sets of variables around which to provide summary information. Each "item" in the resulting three nonvocational profiles required evaluation of the extent to which the individual had both a general problem and whether that limitation was expected to affect his/her achieving the desired job goal. The final nonvocational profiles and variables-factors included in them are C—Physical (8 variables), D—Social-Emotional (5 variables), and E—Neuropsychological (13 variables).

**Program Path and Evaluation Strategy Form.** This checklist (Thomas, 1990) was designed to gather information about approaches to vocational assessment being used with persons with traumatic brain injury. Following pilot studies, training, and professional and consumer input, this form became a research tool for assembling information on types and methods of evaluation used to obtain data. Service needs information items were combined with items drawn from the former Vocational Adaptivity Scale to become the Vocational Needs Inventory.

**Statistical Analyses With the Vocational Assessment Protocol Pilot Version**

The persons profiled in this research included persons with traumatic brain injuries from throughout Region V, including Wisconsin, Minnesota, Michigan, Illinois, Indiana, and Ohio. The site staff who collected the data were responsible for conducting vocational assessments. The sample in this study was comprised of 20 individuals with histories of traumatic brain injury.

Due to the small number of subjects and missing data in certain of the data sets, data from other similar studies conducted by the University of Wisconsin-Stout Research and Training Center were combined in order to examine the statistical properties of certain of the experimental instruments. This data set included 20 subjects from the pilot sites, 27 subjects who had participated in Project HIRe, and 44 subjects who were involved in a New England Study. Project HIRe, a demonstration project to establish supported employment programs in Wisconsin and Minnesota for persons with severe traumatic brain injuries, was conducted between 1989 and 1993. This study provided information on 27 people using the VAP. The New England Study was conducted with vocational rehabilitation counselors trained by Thomas in completing the VAP and was conducted in 1992. These counselors completed protocols from clients on their caseloads in 1992 who had severe traumatic brain injuries. See Thomas, Menz, and McAlees (1993) for more detailed reporting on these other studies. An additional 72 profiles from cognitively affected individuals were also included in factoring and reliability with the VAS in California.

Reliability and factor analyses were computed with the Performance Profiling Forms and Vocational Adaptivity Scales to estimate how well the initial scales demonstrated adequate internal consistency. Where redundancy was found, items were combined or deleted. The data were computed separately for subparts of the two instruments due to small sample sizes and are reported on Table IV-1.[1]

[1]All tables for this report will be at the end of the section in which they are discussed.

Discussions were conducted with evaluators at the pilot sites, the New England study evaluators, and the various advisory sources regarding the effort necessary to complete the VAP. All agreed as to the value of the information obtained from the process but objected that it took too much time to complete and was too cumbersome to use regularly. The reliability and factor analysis results reported on Table IV-1, along with item-response data, were used to guide instrument reviews and to construct a more concise battery of measures.

All the internal consistency implies that the profiles exhibit adequate reliability (.80 and above), except for categories included in the medical information section labeled as "sensory problems" and "other medical issues." This lower level of internal consistency was expected, given that there is no single set of physical symptoms that tend to be associated with brain trauma injuries. Very few subjects had sensory problems (e.g., sight, smell), and the other medical issues included conditions that were inconsistently associated with traumatic brain injury (e.g., cardiovascular). Factor analyses conducted on the subparts of the instruments suggested that various items might be associated with each other, suggesting a smaller number of factors[2].

**Performance Profiles.** The factor analysis of the Performance Profiling Forms suggested that most subparts were comprised of several variables, some of which might have items tapping similar content. When these statistical properties were reviewed in conjunction with the specific content of the items, it appeared that several items could be combined to represent a smaller number of common factors that have clinical value. For example, strength and stamina, weakness and lifting limitations, and fatiguability-endurance all relate to a person's "physical capacity." Likewise, alertness, vigilance, attention and concentration, mental calculation skills, and immediate verbal recall all relate to "freedom from distractibility." A limited number of factors, such as these, were defined within each of the profiles, with the original stems used to focus ratings. Rating directions were modified as well, requesting clinical estimates as to (a) whether the individual is "within normal limits" or has a "minor" or "notable problem" with each factor and, (b) if they have a problem, whether it would affect their achieving their specific job goal. Specific operational definitions were provided for each profile.

**Vocational Adaptivity.** Factor analysis of the data obtained with the Vocational Adaptivity Scales suggested that each of the subscales was comprised of one dominant factor (i.e., accounted for approximately 50 percent or more of the variance) and several sets of correlated items. Using factoring techniques, items that appeared redundant or unrelated to each particular factor cluster were eliminated or modified to permit greater precision in diagnosing strengths and skill deficits. Four shortened profiles were derived and scaling simplified to whether the individual's skills and behaviors were "within normal limits" or that had a "minor" or "notable problem."

[2]There was insufficient variance in responses on "motor strength and coordination" to permit factor analysis.

## The Validation Study

### Validation Sites

A request for proposals was sent to a targeted mailing audience to obtain sites for the validation study. In total, 40 sites submitted applications on the basis of a request for participants. A peer review panel consisting of six judges from RIC and UW-Stout RRTC selected 23 sites from the applicants that would represent the sample from across the United States in order to increase the variety of state systems represented in the sample and the diversity of individuals on whom protocols would be completed. Only sites that agreed to provide 10 complete protocols over a 9-month period of time and could participate in a training session at Chicago were accepted. Travel expenses were partially subsidized by the project. The final sites selected were as follows. The asterisked sites were unable to provide the required number of protocols:

| | |
|---|---|
| Abilities Inc. of Florida | Clearwater, FL |
| Brain Injury Community Services | Santa Fe, NM |
| Center for Neuropsychological Rehabilitation | Indianapolis, IN |
| Center for Neurorehabilitation & Re-Entry | Chicago, IL |
| Courage Center | Golden Valley, MN |
| Curative Rehabilitation Center | Milwaukee, WI |
| Direct Connections | St. Cloud, MN |
| Elgin Rehabilitation Center* | Elgin, IL |
| Evaluation and Training Center | Fargo, ND |
| Hot Springs Rehabilitation Center | Hot Springs, AR |
| Illinois Growth Enterprises | Rockford, IL |
| Jewish Vocational Services | Cincinnati, OH |
| Marianjoy Rehabilitation Center* | Wheaton, IL |
| Lakeshore Rehabilitation Facility | Birmingham, AL |
| Independence and Training Center | Milwaukee, WI |
| New Horizons | Bloomfield, MI |
| Peckham Vocational Industries | Lansing, MI |
| Pioneer Center | McHenry, IL |
| Vocational Rehabilitation - RIC* | Chicago, IL |
| Sharp Work Re-Entry | San Diego, CA |
| Trade Winds Rehabilitation Center | Gary, IN |
| Vocational Development Center | Menomonie, WI |
| Work Skills Corporation | Brighton, MI |

### Training of Practitioners

Prior to implementation, training was jointly provided by staff from the Center and the initial pilot sites on the revised VAP at Chicago in the Spring of 1994. Training included orientation to brain injury, recommendations on collection of data, alternatives to collecting and compiling information, and guidance in use of information for planning. Each site was to provide at least 10 completed protocols. Pilot site staff assisted in providing the training of the

new sites. Sites were closely monitored and incomplete protocols were tracked back to sites for completion. Project staff reviewed procedures with each site after they completed their first two protocols to enhance the quality of the data returned.

### Subjects

Profiles were completed on 151 individuals with traumatic brain injuries at 20 sites across the United States, of which 149 were usable in the analyses. Although numbers of specific profiles included vary between analyses, data analyses are based upon the profiles from the same core of 149 subjects.

## Profile A—Personal Demographic Questionnaire

### Demographics

Table IV-2 summarizes personal demographics of the 149 persons profiled. The large majority were male (75%), single (63%), White (76%), with an average age of 33.1 years and were an average of 6.3 years post-injury at the time the Protocol was completed. Fifteen percent of the sample were Black, 6 percent Asian, and less than 2 percent were Native American.

**Education.** Seventy-five percent had attended regular classes and 85 percent had graduated from high school prior to their injury. Of those graduating, nearly 47 percent had also completed some college or vocational training prior to their injury. Approximately 10 percent graduated from high school with special education. In total, 9.66 percent had attended vocational training, and 6.2 percent had attended college following their injury.

**Developmental History.** A low incidence of prenatal or developmental problems was reported during childhood (26%), during pregnancy or following delivery (7.4%). Behavioral health services were reported for psychiatric or psychological treatment (17.9%), for special education due to slow learning (15.9%), for leaves of absence due to illness or injury (15.9%), and for family counseling (13%). Abuse or neglect were reported for approximately 10 percent and alcohol or chemical abuse/dependence was a problem identified for 19.3 percent of the consumers.

### Causes and Types of Injuries

**Causes.** Almost two-thirds of the head injuries resulted from vehicular accidents (63.1%), with 12.8 percent involving a motorcycle, 3.19 percent involving a bicycle, and 70.2 percent involving an automobile. Approximately two-thirds of motorcycle and auto involved accidents occurred in the absence of recommended safety equipment (i.e., not wearing helmets, not using seat belts). All bicycle injuries in this sample occurred in accidents where the victim did not use a helmet. Among the 34.2 percent of non-vehicular injuries, gunshot and assault comprised 27.5 percent, sporting accidents 5.9 percent, falls 17.7 percent, and other causes 49 percent (e.g., work related, recreation). Where accident was the cause, 41.2 percent of the time the individual was responsible for the accident. Alcohol or drug use was involved in 30.9

percent of the cases and in the vast majority of those cases, the injured person was using alcohol or drugs at the time (84.8%).

**Brain Injuries.** Closed head injuries were most common among the group (72.8%), while non-acute reasons were reported for approximately 12.9 percent (e.g., tumors). Skull fracture was reported in 38.3 percent of the cases and for most individuals this was their first head injury (83.9%). The average or mean length of coma was 40.31 days with a median of 18.5 days. Amnesia periods averaged 56.1 days with a median of 25 days. Mean days for amnesia and coma periods were long due in part to the fact that several persons in the study reported protracted coma periods.

**Other Injuries.** Nearly 80 percent reported sustaining at least one other significant injury, beside their head injury. However, there is no consistent pattern of these other injuries. Approximately 25 percent reported injuries to one or more limbs and/or their face. Less than 20 percent reported back injuries. Nearly 10 percent reported neck and/or internal injuries, and 3 percent reported chest injuries.

### Impact of Injury on Employment and Income

While prognosis for maintaining a regular job are reported as fair to good (61%) and poor prospects are reported for only 15 percent), impact on short and long-term earnings is expected to be substantial. Short-term or long-term impacts on earnings potential are not expected for only 15 percent and 17.7 percent, respectively. Eleven percent were without identifiable sources of income or support and four primary sources of support included Social Security Disability Insurance (36.9%), Other nonspecific income sources were reported by more than a third of the subjects (34.9%). Supplemental Security Income was similarly quite high (32.9%). Workers' compensation, savings, and litigation settlements comprise very small proportions of income sources (3.4%, 7.4%, and 4.0%, respectively). In the largest number of cases, the individual is responsible for his/her primary care (76.5%) and current living arrangements are considered appropriate (89.2%).

### Current and Recurring Problems Resulting from Head Injury

**Cognitive, Physical, Sensory, and Motor Problems.** Cognitive problems were identified for 95.3 percent of the subjects, physical problems were identified for 86.6 percent, and sensory and motor problems were identified for 79.2 percent. Most commonly reported cognitive problems involved memory (83.8%) and organizing and planning ability (56.3%). Problems in reading, writing, visual-spatial skills, attention, and/or communications were reported for between 40 and 44 percent of the subjects. The primary physical problems reported were balance (63.6%), walking (55.8%), weakness (54.3%), and lifting (43%). Coordination (60.2%) and visual acuity (55.1%) were reported as the main sensory and motor problems.

**Psychosocial Problems.** Nearly all individuals reported some variety of recurring emotional difficulties (93.3%) and social and behavioral problems (85.2%). Typical emotional issues included boredom (87.1%), anxiety (69.1%), paranoia or suspiciousness (67.6%), frustration and loneliness (63.3% each), and/or anger (52.5%). Less than 25 percent report

problems with alcohol or substance abuse, depression, or exhibiting symptoms os being "behaviorally out of control." Surprisingly, nearly one-third reported auditory hallucinations at some time since the injury, and five percent reported visual hallucinations, some of which were shortly after the injury.

While a high percent reported social and behavioral problems, fewer of the problems were identified across individuals and there was less consistency in combinations of problems they reported. Impulsiveness (52%), poor judgment (46.5%), irritability (40.2%), and immaturity (37.8%) were the more frequently reported behavioral problems, along with social awkwardness, social withdrawal, and abandonment by friends (27.6%, 38.6%, and 27.6%). Aggressive behavioral problems were not frequently noted (6.3% assaultive, 25.2% non-assaultive aggressiveness).

**Mobility and Independence Needs.** Mobility was indicated as a problem by less than one-quarter of the individuals. Nearly 77 percent walked independently; 12 percent used a crutch, cane, or walker; and approximately 4 percent used a chair or motorized cart. On the other hand, 70.5 percent of the persons profiled reportedly required assistance for independent living, nearly 60 percent report needed assistance in community survival skills.

For those with needs for assistance in community survival skills, their needs were reported for assistance in transportation (84%), in driving the car (45.5%), and in arranging appointments (54.6%). Almost all could make change for $5.00 (91%) and at least 72 percent were able to independently find their way around their neighborhood, cross streets, and/or were aware of general safety issues. Home living skills areas with the greatest needs were in the areas of managing finances (82.9%), preparing meals and shopping for groceries (54% and 52%, respectively), and house cleaning (48.8%). Approximately one-third needed assistance for taking care of minor injuries or obtain medical help. Almost all were able to use the telephone (87%) independently. While only 13.4 percent reported needs for assistance in self-care and hygiene, their needs for assistance spanned the categories of grooming, bathing, and dressing. Most of the assistance needed in this area was for physical assistance.

## Profile B—Personal Demographic Interview

Several analyses of the ratings collected from the individuals served and significant others involved were conducted. In nearly two-thirds of the cases, both the individual and a significant other were asked during the interview to indicate whether each of 14 behaviors had worsened since injury. Table IV-3 reports the extent to which each behavior had worsened, the 95 pairs of individual-significant other ratings, and the total numbers of problems identified. In addition, an estimated rate of agreement was calculated between individuals and significant others (based upon an item-by-item comparison for each client) and the correlation and corresponding t-value based on total number of behaviors that were judged to have worsened were also computed and reported on the table.

**Changes for the Worse That are Common.** Table IV-4 identifies behaviors for which there was significant disagreement between individuals-significant other pairs. On the average, approximately eight areas were identified as having worsened following brain injury for this

sample of clients. Significant others report a greater number of worsening behaviors (9.2 versus 7.8), though item-by-item they were in agreement on 75.4 percent of the items. All three sets identified the same seven areas as having worsened for approximately two-thirds of the individuals. Significant others identify three additional areas for more than two-thirds of the individuals.

The eight areas that have worsened since head injury were the individual's ability to learn and recall new information, speed of response to questions or novel situations, and memory for things that need to be done routinely in the future (70.8%, 72.3%, and 65%), emotional status (67.2%), physical and emotional endurance (73.4%), physical skills necessary for work, play, or do self-care (67.9%), and potential for job placement (67.2%). Emotional tolerance for stress, ability to plan and carry out activities, and independence in initiating and completing tasks are three additional areas where highly consistent changes were reported since injury (approximately 73% each) by significant others.

**Less Consistent Changes.** Overall the person's emotional and physical (light, sound, etc.) sensitivity and social and interpersonal adaptive skills worsened for less than 50 percent of the group. Relationships with family members and close friends deteriorated for 38.7 percent of the cases. For only 15 percent of the cases was alcohol or drug use reported as having worsened.

**Disagreements Between Individuals and Significant Others Regarding Changes.** The individual and their significant others differed in the number of areas where they perceived things. Significant others were more likely to report deteriorating behaviors, than the individual themselves (see Table IV-4). Significant others were also more likely to report worsening or deterioration in planning and carrying out activities, in independence to start and complete tasks, in the individual's tolerance for stress, and in potential to get a job ($p < .01$) and in their emotional status, social and personal skills, and sensitivity ($p < .05$).

## Profile C—Physical Profile

**High Incidence Problems.** Significant general problems (see Table IV-5) are most consistently noted across the sample in four of the eight areas of physical demands: physical capacity (71.2%), movement skills (61.2%), adroitness (59.7%), and sensory systems (56.8%). Only in the case of physical capacities (strength, stamina, lifting, endurance) are physical problems also noted as relevant to specific job goals of the individuals for more than half of the sample. Movement skills (ambulation, gross motor coordination) and adroitness (fine motor coordination, dexterity) are indicated as problems (40+%) relevant to the individual's job goals. Job specific problems for sensory systems (e.g., vision, balance) are noted in less than 30 percent of the cases.

**Lesser Problems.** General problems in sensory perception, chemical abuse, chronic pain, and other issues (e.g., diabetes, respiration) are typically noted for well under 30 percent of the sample. Job specific problems in these areas are noted for generally less than 15 percent of the cases, except for chronic pain, which is a reported problem for 21.6 percent of the subjects.

## Profile D—Social-Emotional Profile

**High Incidence Problems.** Social adjustment (73.3%), emotional stability (63.4%), and activity level (55.7%) are three areas where general problems are noted for significant proportions of the sample (Table IV-6). Among these, only social adjustment (social appropriateness/common sense, accurate self-appraisal, age appropriate maturity) is reported to potentially affect achieving specific job goals for half of all cases. Job specific problems relative to emotional stability (tolerance of frustration, appropriate emotional display) and for activity level (initiative to work, enthusiasm) are noted for almost 40 percent of the sample.

**Lesser Problems.** Intrusiveness (either physical behavioral or verbal) and suspected chemical use problems (particularly alcohol) are general problems for under 40 percent of the sample. Correspondingly, these are noted as job specific problems for approximately a quarter of the sample.

## Profile E—Neuropsychological Profile

**High Incidence Problems.** Over 60 percent of the sample are reported to have significant general problems (see Table IV-7) in 7 of the 13 neuropsychological areas profiled and 4 of the 7 are considered significant problems that will affect achieving their respective job goals. High percents of the sample have general problems (70% to 88%) and job specific problems (50% to 70%) in their use of executive and higher order skills (problem solving, information processing, planning and insightfulness, awareness of limitations), in distractibility (attention and concentration, immediate verbal recall), in immediate and delayed memory (auditory/verbal, visual recall), and in intellectual performance skills (attention to complex visual detail, perceptual organization and reasoning, visual organization skills). Slightly lower percents of the sample have general problems (59% to 69%) in intellectual verbal factors (common sense and social reasoning, abstraction skills), in their communications skills (written expression, following verbal instructions), psycho-motor skills (gross motor, fine motor, drawing and writing), and other cognitive variables (mental flexibility, inattention, and perseveration tendencies). Correspondingly, job specific problems were indicated as problems for less than 45 percent of the cases for these four neuropsychological factors.

**Lesser Problems.** Other memory skills (prospective, remote), affective mental health issues (depression, anxiety), and general mental health issues (self-centered and childlike, disinhibited behavior) are neuropsychological factors identified as general problems for under 50 percent of the sample (37% to 48%). Psychotic mental health issues (suspiciousness, delusions) and maladaptive personality variables (passive-aggressive, obsessive, compulsive features) were infrequently indicated as general or job specific problems (8% and 29%). These five neuropsychological factors were indicated as problems in job specific goal attainment for less than one-third of the sample (9% to 31%).

## Profile F—Job Search Profile

**High Incidence Problems.** Half of the 10 job search skills examined were identified as problem areas for over 50 percent of the sample (Table IV-8). Over 60 percent inadequately

described their disability in functional-nonstigmatizing terms and could not produce typed employment search letters. Over 50 percent had problems identifying reasonable job goals, exhibited limited knowledge of how to canvass the community for employment, and demonstrated a limited comprehension of how much consistent effort they need to spend in searching for employment.

**Lesser Problems.** Between 44 and 48 percent reportedly encountered problems tracking job leads and following-up on employer contacts and could not provide complete references when needed that could support their claims to skills related to their job goals. Less than 40 percent could not demonstrate how to make employer contacts. Thirty percent lacked reliable access to transportation.

### Profile G—Interviewing Skills Profile

**Higher Incidence Problems.** Skill deficiencies were noted for over 50 percent of the sample in regard to the 16 interviewing skills examined (see Table IV-9). Nearly two-thirds were unable to complete a job application independently and accurately and 58 percent could not provide an organized, neatly typed resume that reflected their previous training and experience, nor could they deal with sensitive information in a positive manner. Approximately one-half had problems relating their background, training, and experiences as qualifications for an intended job, expressing general knowledge of job and company in which they might seek a job, and were unable to adequately respond to open-ended interview questions.

**Lesser Problems.** Less than half of the subjects encountered problems explaining gaps and problems in their employment history or using the phone to inquire about jobs. Telephone demeanor and language, requesting information about wages and benefits, and keeping pace and place during interviews were also problems for less than half of the subjects. Less than 20 percent were able to show common courtesy in interviews or failed to arrive on time, present themselves adequately, and wait appropriately during the time before the interview.

### Profile H—Critical Work Behavior Profile

**Higher Incidence Problems.** There is considerable variability among the sample in the problems identified among the 28 critical work behaviors examined (Table IV-10). Approximately 55 percent had problems related to work productivity and work pace and/or potential to advance on the job or to assume new job responsibilities. Problems demonstrating practical approaches to solving work problems, remembering work instructions, and/or in their work stamina was found approximately 45 percent of the sample. Approximately one-third had problems in dexterity in relation to desired job goals, keeping busy during slow times, expressing themselves clearly and efficiently, being appropriately self-assertive, and/or in delaying immediate desires in order to achieve a longer term goal.

**Lesser Problems.** Nearly 30 percent had problems in skill development consistent with job demands, organization of work and related materials, reading instructions and memos, accurately following supervisor instructions, and/or in quality of work. Between 20 and 29 percent had problems performing simple job-related math activities; punctuality for starting work

and returning from breaks; expressing enthusiasm, showing motivation; working independently after initial training; showing desire or need to work; seeking assistance when needed; following shop rules, regulations, and safety procedures; and/or in having access to a personal network to assist in locating work and provide necessary support. Twenty percent or less had problems following through on work tasks to completion, showing up for work daily or calling in with reasonable excuses for absences, demonstrating knowledge of their job, awareness of surroundings and activities in immediate vicinity, and in personal hygiene and grooming.

### Profile I—Social Adaptive Behavior Profile

**High Incidence Problems.** Three of the 24 skills and behaviors on the profile are identified as high incidence problems (see Table IV-11). Approximately 62 percent of the sample had problems maintaining a realistic opinion of their achievements and abilities, 53 percent had problems handling minor work stress and frustrations on the job, and approximately 49 percent had difficulty profiting from instructions or criticism. Secondary areas where problems were noted included social adaptive behaviors including display of appropriate expression of emotions (38.3%), awareness and sensitivity to feelings of others, and in their ability to see outcomes of events as controllable and determined by action on the job (both 33.9%).

**Lesser Problems.** Fewer than 15 percent show problems of courtesy to co-workers, maintaining proper posture and distance during conversations, cooperation with co-workers, and displaying acceptable morals and ethics on the job. Less than 20 percent show problems involving respect for supervisor authority, acceptance by co-workers, or displaying facial expressions appropriate to situations. Between 20 and 25 percent exhibited problems involving attitudes and interference of their family or parents in their employment, being too bold in social situations, disturbing others at work, making others feel uncomfortable because of their presence or behavior, being too loud, establishing an appropriate relationship with their supervisor, or cooperating with their supervisor. Less than 30 percent showed problems providing acceptable excuses for inappropriate behavior, making inappropriate comments, mood swings or unpredictable behavior, or refraining from complaining about others or work tasks.

### Program Path and Evaluation Strategy Form

This form was used to summarize the status, evaluation methodologies and/or data sources used to complete the several profiling forms, and severity of vocational limitations respective to the identified job goal (Table IV-12). Thirty-one percent of the sample were individuals presently involved in at least one other program at the participating program while 69 percent were new referrals to vocational assessment programs.

**Evaluation Procedures.** At least two evaluation formats were typically used. The most commonly used was a comprehensive vocational evaluation (65.5%) and either a return-to-work assessment (38%) or a vocational readiness assessment (35.9%). Specific/baseline behavioral assessments were conducted in approximately 22 percent of the cases. Multiple assessment methodologies were typically relied upon in evaluation. Facility-based situational assessments (70.7%), work samples (65%), and psychometric testing (50%) were most typically used.

Community-based work site assessments were used in approximately 34 percent of the evaluations conducted during this study.

**Post-Assessment Referrals.** Following evaluation, 24.4 percent were referred to another agency because vocational rehabilitation was not considered appropriate, 38.2 percent were referred for immediate employment services (e.g., placement, supported employment), and the remaining 49.6 percent were referred to employment preparation services (e.g., interview training, job-seeking skills, vocational adjustment).

**Vocational Limitations.** The results of each evaluation were rated as to how vocationally limited the individuals were with respect to achieving their targeted vocational goal. Approximately five percent were judged to have no significant limitation; likewise, nearly five percent were felt to have profound vocational limitations. The remaining persons evaluated were somewhat equally/ proportionately judged as having mild (30.5%), moderate (33.3%), or severe (26.2%) vocational limitations.

## Vocational Service Needs Inventory

**Multiple Services Needed.** This form was used to summarize vocational service needs identified using several profiling forms (see Table IV-13). Multiple service needs were typically identified at the conclusion of each evaluation. The large majority of clients were found to need job site services (84.6%) and preparation for work services (77.9%). Additional assessments and psychotherapeutic or counseling services were identified for two-thirds of the clients. Medically related services were identified for approximately half (49.7%) and special wage certificates or work permits were suggested only for 5.4 percent of the sample.

**Job Site Services.** Multiple job site services were typically identified. Job coaching (78%) and employer education (67.4%) were the two primary recommended services. Post-employment follow-up, job site assessment, and client advocacy were secondary priority service needs (56.8%, 53.8%, and 49.2% respectively). Job-site intervention, transportation to work, work site accommodations, and return to work trials were recommended for between 30 and 40 percent of these individuals. Post-employment job upgrading, rehabilitation technology evaluation, and mobility training were recommended for less than 15 percent of the group.

**Work Preparation Services.** Highly individualized sets of work service needs were identified, with minimal discernable common patterning of needs across the sample. For about 45 percent, interview training, and job placement were recommended. For 35 percent (approximately), job seeking skills, job interviewing, and selective job placement were recommended. For approximately 30 percent, work adjustment, work hardening, or occupational exploration were recommended. For between 20 and 30 percent of the group recommended for work preparation services, recommendations to provide assistance with application review, job matching, job club, transitional sheltered employment, vocational training, and/or telephone interviewing were made. Finally, job shadowing, apprenticeship-traineeship, informational interviewing, and/or subsidized employment were recommended for less than 20 percent of the sample.

**Assessment Services.** Various combinations of assessment services were recommended for two-thirds of the sample. Community-based situational assessment or additional vocational evaluation were suggested (41.7% and 36.4%, respectively). Vocational interest and aptitude testing, neuropsychological counseling, or employment interview assessments were recommended for approximately 28 percent of the group. Psychiatric evaluations were recommended for only 7.6 percent of the group, and alcohol and drug assessments were recommended for 19.7 percent of the group.

**Psychotherapeutic or Counseling Services.** Therapy needs typically included were for vocational guidance and/or for case management. Psychotherapy or crisis intervention was recommended for only a quarter of these individuals and chemical dependency treatment for another tenth of the sample.

**Medical Related Services.** Medical related services were identified for nearly half of the sample (49.7%). These were most often for a combination of therapies (OT, PT, Speech) or medication management. Pre-employment physical or alcohol and drug treatment were indicated in approximately 16 percent of these referrals.

## Estimation of Reliability and Validity

### Statistical Approaches

Reliability estimates and principal components factor analyses were computed with the new samples to examine underlying factors in light of the revisions made following pilot testing. These analyses were conducted with Profiles B—Demographic Interview, the three nonvocational profiles (C—Physical, D—Social-Emotional, E—Neuropsychological), and the four vocational profiles (F—Job Seeking Skills, G—Interviewing Skills, H—Critical Work Behaviors, I—Social Adaptive Behaviors).

Reliability and factoring were computed for each profile instrument, when combined by profile type (vocational, nonvocational), and separately where both scaling for "general problem" and for "job specific problem" were examined (i.e., with the nonvocational profiles). Parallel estimates were also computed based upon the actual two-point (i.e., yes, will affect job goal; no, will not affect job goal) and three point scaling (i.e., within normal limits; minor problem; and notable problem) used in clinical applications.

### Reliability

Internal consistency estimates are presented on Table IV-14 and the factor analysis results are presented on Table 16. The internal consistency estimates suggest that all instruments contain items that are highly correlated within each of the respective profiles, particularly the four vocational profiles. Prior factor analyses revealed a strong central factor underlying each scale. Internal consistency estimates are also higher using the 3-point scaling (i.e., as would be used in clinical applications) with both the vocational and nonvocational profiles.

**Demographic and Vocational Profiles.** Reliability estimates for the vocational profiles

are quite acceptable, ranging from approximately .88 to .94 for 3-point scaling and .79 to .92 when dichotomized. Estimates of internal consistency for individual and significant other's ratings provided for Profile B, the Personal Demographic Interview, were less robust, ranging between .78 and .88.

**Nonvocational Profiles.** All alpha coefficients were significant for the nonvocational profiles ($p < .001$), but not nearly as high as with the vocational profiles. Ratings for "general problem" ranged from .52 to .81 when using the clinical scaling and .34 to .73 when using a dichotomy. For "job goal specific" impact ratings, the coefficients ranged from .66 to .82.

Lower values were expected with the nonvocational profiles for two reasons. First, it was the intent to identify the effects of traumatic injury upon related, but independent, functions with these profiles. Second, prior factoring with the pilot data suggested that each profile might be comprised of a small set of factors, and the profiles were revised to achieve data on such "independent" factors.

**Factor Analyses**

Factor analyses conducted with the validation study data appear to support the above expectations. As seen on Table 16, there is close correspondence between the numbers of factors identified for each nonvocational profile compared and the number of "items" in each profile. Relatively high percents of variation are accounted for by these factors.

Items on the vocational profiles clustered around one or two factors. Most, if not all, items from Profiles F—Job Seeking Skills, G—Interviewing Skills, and I—Social Adaptive Behaviors loaded on single factors (10, 16, and 23 of 24, respectively). Even though items from H - Critical Work Behavior items are represented on several factors, nonetheless more than half of these items loaded on a single factor as well (18 of 20). As expected, fewer factors (proportionately) accounted for the large majority of variation for the vocational profiles.

Variables from the nonvocational profiles were much more dispersed. Only in the case of Profile D—Social-Emotional Profile, did the variables group together on a single factor. Though the numbers of variables included under any of these three profiles are small, they tend to be distributed across several factors, most typically three or four factors. Further, more factors are required to account for the majority of item variance, both on a profile-by-profile basis and when all nonvocational variables are combined and factored. These findings conform to expectations that singular explanatory factors that have high internal consistency would not be found, due to the wide differentiation of problems arising from traumatic brain injuries. These findings are also supportive of the hypothesis that the "variables" need to be considered as indicators of the functional limitation caused by brain trauma, rather than as linearly combinable items for which some common score might be computed, possess meaning relevant to an individual or to describe a sample of people with traumatic brain injuries.

**Additional Evidence**

**Personal Demographic Questionnaire**. By the nature of data collected with Profile

A—Personal Demographic Questionnaire, traditional statistical or psychometric analyses were not amenable to analysis rather than descriptive statistical analyses. Evidence of validity of the data obtained, however, can be found in the interviewer's estimation on the accuracy of responses:

| Estimated Validity of Responses | Percent (N=144) |
|---|---|
| Poor: many guesses | 2.8 |
| Fair: several guesses | 3.5 |
| Good: few guesses | 62.5 |
| Very accurate | 31.3 |

**Personal Demographic Interview**. For Profile B—Personal Demographic Interview, additional evidence of reliability may be found from two additional sources. As with Profile A, the interviewer estimated the accuracy of information presented by an individual and a significant other (if both were involved in the interviews). Further, pairs of ratings were obtained from 95 individuals and significant others. While these should not be construed as "independent" estimates of the same behaviors (a condition for concurrent validity), the pairs indicate general concurrence on what are problems for individuals. Concurrent validity, though, needs to be systematically ascertained.

| Estimated Validity of Responses | Percent (N=144) |
|---|---|
| Poor: many guesses | 3.5 |
| Fair: several guesses | 15.3 |
| Good: few guesses | 52.1 |
| Very accurate | 29.2 |

Percent (behavior-by-behavior) agreement (N=95) 75.4
Correlation for number behavior identified (N=95) .483 ($p < .001$)

## Conclusions and Recommendations

The above findings support the expectations of the researchers and are further supported by observations offered by personnel who have made use of the Vocational Assessment Protocol. The validation sample data show excellent internal consistency for vocational profiles and moderate to low internal consistency for non-vocational profiles. Factor analyses conducted with those same data reflect relative independence of specific variables of which the nonvocational profiles are comprised, as intended in the VAP's development.

Based upon the findings reported above and the clinical feedback from practitioners and consumers with whom the instruments have been used, the instruments appear to be robust and appropriate for use for profiling strengths and needs of persons with traumatic brain injury. This protocol can be used by practitioners who have been trained in (a) basic brain injury and recovery; (b) rehabilitation and evaluation principles associated with brain injury; and (c) collection, completion, synthesis, and interpretation of information drawn from the various

evaluation sources and profiled on the VAP.

The following are specific recommendations based upon our experience and research findings from the several sources. The recommendations are specifically directed toward further development and to increase utility of the VAP in clinical and community settings. Seven recommendations are offered:

**Continuing Development**

1. **Training.** Training is suggested to ensure that the VAP is reliably and appropriately used. Training during field testing was provided by the investigators in this study and by staff from the original pilot sites. Alternative formats and methods for efficiently training other users need to be explored and developed. For instance, video-tutorials and computer assisted approaches may prove valuable in this regard.

2. **Refinement.** In its present form, the VAP requires a considerable investment of time to use until experience with the protocol has been gained. The linkage between diagnosis and planning results from synthesis of information and needs to be better refined. The opportunity to identify strengths and compensatory activities needs to be cultivated in training, such that the emphasis does not simply revert to "problem identification," instead of planning around strengths and residual functioning or compensation and adaptation. The potential for computerization of profiling and planning activities with the VAP should be explored as a method for (a) improving the quality of information reporting and synthesis and (b) achieving alterative methods for inputing and deriving common plans based upon historic experiences in working with persons with brain injury.

3. **Clinical Applications.** Two recommendations are proposed with respect to clinical applications. First, solid examples of how (a) information is accumulated, (b) how it is synthesized, (c) how the synthesized information is effectively utilized in planning, (d) how planning evolves based upon new information, and (e) what successes or impacts the protocol-based planning has on vocational and social goals need to be documented for both clarification purposes (i.e., to better understand the dynamics and problems encountered with the VAP) and training purposes (i.e., as models that potential users might emulate). Second, treatment, compensatory approaches, and alternative strategies need to be defined and tested to determine which are effective in reducing high incidence vocational barriers for persons with brain injury. Practices that are effective in building on specific and profiled strengths of individuals also need further study and refinement.

**Research and Psychometric Issues**

1. **Reliability.** Inter-rater and test-retest reliability must be established to guard against fallacious planning. Presently, internal consistency estimates indicate that the content of each of the profiles tends to be internally consistent and thus factors are correlated. To what degree independent, equally informed observers provide "similar" information

is uncertain. In the absence of any treatment or changes due to compensation or improved functions the degree to which clinicians and/or consumers would report strengths and problems of similar intensity at comparable times is an issues that is presently unknown. Both issues must be focused upon in the next stages of research with the VAP.

2. **Factor Structure.** Present data suggests that the computer generated factors share considerable "common variance," profile by profile. To what degree such factors retain their robustness when examined using larger samples or among other homogeneous populations (e.g., spinal cord and traumatic brain injury) and to what degree such factors permit further reduction in length or complexity of the profiles need to be examined. Samples of sufficient size and relevant characteristics need to be obtained to permit factoring across profiles.

3. **Validity.** The extent to which functional strengths, problems, and interventions permit achieving vocational goals of individuals needs further examination as well. Whether the data permit us to do better and more efficacious planning that leads to predictable outcomes is a question to be addressed by additional research. Follow-up studies of vocational outcomes for the present sample of individuals need to be continued to detect how the process of rehabilitation has been influenced by use of the VAP and how strategies derived from the VAP have affected consumers and clinicians needs to be studied. Whether any of the strengths and/or problems are particularly indicative of potential success or failure and whether better outcomes have been achieved using VAP data are additional questions to be pursued by future research.

4. **Functional Syndromes.** Traumatic brain injury is characterized by differential physical and psychosocial effects of this class of injuries. How people differentially deal with those consequences as well as whether constellations of characteristics and interventions are more or less common in this population is yet another researchable question to be examined in subsequent research. Finally, we need to look to the data and outcomes among these samples not only to find predictors but to find profiles that might be used in clinical work as models or principles with which to guide treatment more efficiently and reliably with other individuals or groups of individuals.

## Table IV-1. Initial Reliability Analyses and Factor Analyses of the Performance Profiling Forms and the Vocational Adaptivity Scales

| Profiles, Scales, and Subscales | Number of Items | Number of Individuals | Reliability Analyses: Alpha Level | Item Means | Scale Means | S.D. | Factor Analyses: Percent Variance Accounted 1 | 2 |
|---|---|---|---|---|---|---|---|---|
| **Performance Profiling Forms** | | | | | | | | |
| **Physical Variables** | | | | | | | | |
| Motor Strength and Coordination | 9 | 17 | .863 | .555 | 5.000 | 4.650 | - | - |
| Sensory Problems | 9 | 18 | .648 | .277 | 2.500 | 2.595 | 24.7 | 21.3 |
| Other Medical Issues | 8 | 20 | .362 | .218 | 1.750 | 1.802 | 16.7 | 15.0 |
| **Neuropsychological Variables** | | | | | | | | |
| General Cognitive Functions | 17 | 61 | .900 | .857 | 14.573 | 7.306 | 38.0 | 19.4 |
| Memory | 6 | 53 | .895 | 1.025 | 6.150 | 3.488 | 61.1 | 12.8 |
| Communication Skills | 8 | 62 | .826 | .554 | 4.435 | 3.839 | 45.3 | 16.9 |
| **Social-Emotional Variables** | | | | | | | | |
| Social Adjustment | 19 | 67 | .899 | .575 | 10.925 | 7.805 | 38.1 | 13.2 |
| Daily Living Skills | 9 | 64 | .907 | .590 | 5.312 | 5.054 | 56.9 | 10.4 |
| **Vocational Adaptivity Scales** | | | | | | | | |
| Job Search Skills | 10 | 120 | .908 | 2.329 | 23.291 | 7.883 | 54.9 | 10.9 |
| **Interviewing Skills** | 17 | 97 | .959 | 2.642 | 44.917 | 13.736 | 59.1 | 6.6 |
| **Critical Work Behaviors** | 30 | 104 | .965 | 2.961 | 88.855 | 22.135 | 48.8 | 8.4 |
| **Social Adaptive Behaviors** | 24 | 99 | | 3.001 | 72.020 | 18.421 | 56.3 | 5.8 |

Table Notes:
1. Ns vary between analyses due to incompleteness of data. Where possible, data from all three studies were available for reliability and factor analyses of the Vocational Adaptivity Scale.
2. Alpha is a measure of scale internal consistency and Principal Components Factor Analysis is a method for exploring the structure of scales or to define meaningful scales.

## Table IV-2. Summary of Demographic Responses (N = 149)[1]

| Demographic Item | Percents |
|---|---|
| **1. Gender of Client (n= 149)** | **100.00** |
| Male | 74.50 |
| Female | 25.50 |
| **2. Average Age of Client in Program (n=148)** | **33.10** |
| **3. Average Age of Client at Time of Injury (n=147)** | **26.63** |
| Average Years Post Injury at Time of Assessment (n=146) | 6.26 |
| **4. Current Marital Status of Client (n=149)** | **100.00** |
| Single | 63.09 |
| Separated | .67 |
| Widowed | .67 |
| Married | 14.77 |
| Divorced | 20.13 |
| Other | .67 |
| **5. Ethnic Background of Client (n=149)** | **100.00** |
| Black | 15.44 |
| Hispanic | .67 |
| Asian | 6.04 |
| White | 75.84 |
| Native American | 1.34 |
| Other | .67 |
| **7. History of Prenatal or Developmental Problems, Hyperactivity, Learning Problems or Adjustment Problems During Their Childhood (n=39)** | **26.17** |
| **During Pregnancy, Mother Experienced Following Problems (n=11)** | **7.38** |
| Alcohol use | 27.27 |
| Prescription or nonprescription chemical use | 18.18 |
| Serious illness or injury | 18.18 |
| Premature or difficult delivery | 54.55 |
| **After Birth, Following Problems Were Encountered (n=11)** | **7.38** |
| Emergency surgical or medical intervention | 54.55 |
| Seizures | 9.09 |
| Infections, fevers, or diseases requiring hospital treatment | 45.45 |

[1] N = the total number of profiles completed and used to compute percents responding to each item or profile. The "n" in parenthesis is the number of profiles used to compute percents, means, or medians for each item alternative.

| Demographic Item | Percents |
|---|---|
| **8. Education Completed Prior to Injury (n=145)** | **97.32** |
| Regular grade school classes | 75.17 |
| Special education classes in grade school | 9.66 |
| Regular high school classes | 75.17 |
| Special education classes in high school | 9.66 |
| College | 26.90 |
| Vocational/technical training | 20.69 |
| **Education Completed Since Injury (n=145)** | |
| Regular grade school classes | 2.76 |
| Special education classes in grade school | 3.45 |
| Regular high school classes | 7.59 |
| Special education classes in high school | 7.59 |
| College | 6.21 |
| Vocational/technical training | 9.66 |
| **Special Instructional Services Needed** | |
| Early childhood stimulation for developmental delays | .69 |
| Special education due to emotional or behavioral disability | 5.52 |
| Remedial education | 7.59 |
| Learning disability classes or instruction | 11.03 |
| Special education due to slow learning | 15.86 |
| Leave of absence from school due to serious illness, injury, or other reasons | 15.86 |
| Speech or language therapy | 11.03 |
| Visual or hearing adaptation or accommodations | 8.28 |
| Treatment for attention deficit hyperactivity disorder using stimulant drugs | 4.14 |
| Psychiatric or psychological treatment | 17.93 |
| Inpatient psychiatric/psychological treatment | 8.97 |
| Outpatient psychiatric/psychological treatment | 12.41 |
| Family counseling or therapy | 13.10 |
| Out of home placements for living purposes | 11.72 |
| **Experienced During the Developmental Years** | |
| High fever over 105 degrees | 5.52 |
| Abuse or neglect (physical, sexual, or psychological) | 9.66 |
| Alcohol or chemical abuse/dependence | 19.31 |

| Demographic Item | Percents |
|---|---|
| **9. Potential Effects in Short Term Earnings Anticipated Over 2 Years (n=146)** | **97.99** |
| No effect | 15.07 |
| Mild reduction | 28.08 |
| Substantial reduction | 31.51 |
| Severe reduction | 25.34 |
| **Potential Effects on Long Term Earnings (n=147)** | **98.66** |
| No effect | 17.69 |
| Mild reduction | 31.29 |
| Substantial reduction | 24.49 |
| Severe reduction | 26.53 |
| **10. Probability of Maintaining a Regular Job (n=146)** | **97.99** |
| Excellent | 21.23 |
| Good | 34.93 |
| Fair | 26.02 |
| Poor | 15.07 |
| None | 2.74 |
| **13. Current Living Arrangement are Appropriate (n=148)** | **89.19** |
| **14. Who is Responsible for Individual's Primary Care (n=149)** | **100.00** |
| Self | 76.51 |
| Parent | 8.05 |
| Son/daughter | .00 |
| Spouse | 1.34 |
| Friend | .00 |
| Attendant | .67 |
| Facility (hospital, nursing home, etc.) | 3.36 |
| Other | 3.36 |
| **15. Current Sources of Income and Support (n=149)** | **100.00** |
| No source of income is received | 11.41 |
| Self-employment income | 4.70 |
| Savings | 7.38 |
| Workers' Compensation Benefits | 3.36 |
| Litigation settlement | 4.03 |
| Public Assistance or Aid to Families with Dependent Children | 5.37 |
| Supplemental Security Income | 32.89 |
| Veterans' benefits | 2.68 |
| Unemployment Compensation | 2.01 |
| Pension or retirement funds | 1.34 |
| Social Security Disability Insurance | 36.91 |
| Other | 34.90 |

| Demographic Item | Percents |
|---|---|
| **16. Type of Brain Injury (n=147)** | **98.66** |
| Closed head injury (brain injured but not penetrated by sharp object) | 72.79 |
| Open head injury (brain injured by penetration of object through skull) | 10.20 |
| Other injury not related to external force trauma (e.g., tumor or aneurysm) | 12.93 |
| Uncertain | 2.04 |
| **17. Cause of the Injury** | **97.32** |
| **Vehicle Accident (n=94)** | **63.09** |
| Automobile (car, truck) accident with seat belt | 25.53 |
| Motorcycle accident with helmet | 3.19 |
| Bicycle accident with helmet | .00 |
| Hit by car (pedestrian) | 10.64 |
| Automobile (car, truck) accident without seat belt | 44.68 |
| Motorcycle accident without helmet | 9.57 |
| Bicycle accident without helmet | 3.19 |
| Other vehicle | 3.19 |
| **Non-Vehicle Accident (n=51)** | **34.23** |
| Sports accident | 5.88 |
| Gunshot | 15.69 |
| Assault | 11.76 |
| Fall | 17.65 |
| Other | 49.02 |
| **Client was Responsible for Accident (n=102)** | 41.18 |
| **18. Client's Skull Fractured** | **38.26** |
| **19. Injury Was Alcohol or Drug Related (n=46)** | **30.87** |
| Injured Person Was Using Alcohol or Drugs | **84.78** |
| **20. Number of Head Injuries With Loss of Consciousness (n=137)** | **91.95** |
| One | 83.94 |
| Two | .73 |
| Three or more | 7.30 |
| Don't know or unsure | 8.03 |
| **21. Coma Period Reported (n=98)** | **65.77** |
| Average Number of Days for Those Reporting Coma | 40.31 |
| Median Number of Days for Those Reporting Coma | 18.50 |
| **22. Amnesia Period Reported (n=47)** | **31.54** |
| Average Number of Days for Those Reporting Amenesia | 56.06 |
| Median Number of Days for Those Reporting Amenesia | 25.00 |

| Demographic Item | Percents |
|---|---|
| **23. Report Any as Current Problems Resulting From the Head Injury** | **99.33** |
| **Physical Problems (n=129)** | **86.58** |
| Balance (dizziness) | 63.57 |
| Lifting | 43.41 |
| Walking | 55.81 |
| Spinal cord injury | 5.43 |
| Weakness | 54.26 |
| Other | 35.66 |
| **Sensory and Motor Problems (n=118)** | **79.19** |
| Visual | 55.08 |
| Hearing | 19.49 |
| Smell | 14.41 |
| Taste | 12.71 |
| Coordination | 60.17 |
| Pain perception | 20.34 |
| Seizures | 22.03 |
| Other | 9.32 |
| **Cognitive Problems (n=142)** | **95.30** |
| Memory | 83.80 |
| Reading | 40.85 |
| Writing | 40.14 |
| Visual-spatial | 44.37 |
| Attention | 44.37 |
| Communication | 40.85 |
| Organizing and planning ability | 56.34 |
| Other | 9.15 |

| Demographic Item | Percents |
|---|---|
| **24. Report Following as Current or Recurrent Problems** | **97.32** |
| **Emotional Related Problems (n=139)** | **93.29** |
| Alcohol or substance abuse | 24.46 |
| Depression | 24.46 |
| Anxiety | 69.06 |
| Frustration | 63.31 |
| Boredom | 87.05 |
| Loneliness | 63.31 |
| Anger | 52.52 |
| Paranoid or suspiciousness | 67.63 |
| Auditory hallucinations | 31.65 |
| Visual hallucinations | 5.04 |
| Behaviorally out of control | 23.02 |
| Other | 8.63 |
| **Social and Behavioral Problems (n=127)** | **85.23** |
| Aggressive - nonassaultive | 25.20 |
| Poor judgement | 46.46 |
| Immature | 37.80 |
| Impulsive | 51.97 |
| Socially awkward or uncomfortable | 27.56 |
| Aggressive - assaultive | 6.30 |
| Irritable | 40.16 |
| Socially isolated/withdrawn | 38.58 |
| Abandoned/rejected by friends | 27.56 |
| Other | 4.72 |
| **25. Other Significant Injuries Reported (n=119)** | **79.87** |
| Face | 23.53 |
| Neck | 12.61 |
| Back | 18.49 |
| Chest | 3.36 |
| Right arm | 25.21 |
| Left arm | 26.89 |
| Right leg | 30.25 |
| Left leg | 23.53 |
| Internal | 10.08 |
| Not applicable | 12.61 |
| Other | 27.73 |

| Demographic Item | Percents |
|---|---|
| **26. Current Mobility Needs of Client (n=146)** | **97.99** |
| Walks independently | 76.71 |
| Uses crutches/walker/cane | 11.64 |
| Uses standard wheelchair | 3.42 |
| Uses electric wheelchair | .68 |
| Battery operated cart | .00 |
| Confined to bed | .00 |
| Other | .68 |
| Multiple response | 6.85 |
| **27. Report Current Level of Independence** | **70.47** |
| **Self-Care and Hygiene Problems (n=20)** | **13.42** |
| Selects clothing | 45.00 |
| Dresses self | 60.00 |
| Bathes self | 70.00 |
| Grooming | 70.00 |
| **Community Survival Skills Problems (n=88)** | **59.06** |
| Makes change for $5.00 | 9.09 |
| Finds way in neighborhood | 18.18 |
| Drives a car | 84.09 |
| Uses public transportation | 45.45 |
| Crosses streets | 21.59 |
| General safety awareness | 28.41 |
| Arranges own appointments | 54.55 |
| **Home Living Skills Problems (n=82)** | **55.03** |
| Cleans the house | 48.78 |
| Takes care of minor injuries | 31.71 |
| Obtains medical help if needed | 32.93 |
| Uses telephone | 13.41 |
| Shops for groceries | 53.66 |
| Manages own finances | 82.93 |
| Prepares own meals | 52.44 |
| Washes dishes | 30.49 |
| **Relationship of Respondent Completing to the Individual (n=145)** | **97.32** |
| Individual With Traumatic Brain Injury | 47.59 |
| Child | .69 |
| Sibling | 2.07 |
| Spouse | .69 |
| Parent | 5.52 |
| Other | 24.14 |
| Multiple Response | 19.31 |

## Table IV-3. Summary of Individual and Significant Other Observed Changes in Individual's Behaviors (N = 149)[2]

| Items from the Personal Demographic Interview | Percents Reporting Behavior Changed for the Worse[3] | | |
|---|---|---|---|
| | All Individuals (n = 137) | Pairs (n = 95 ) | |
| | | Individual's Judgment | Significant Other |
| **Percent Personal Demographic Interviews Reported** | 91.95 | 63.76 | 63.76 |
| 1. Ability to learn and recall new information | 70.80 | 68.42 | 73.68 |
| 2. Memory for things that need to be done routinely or in the future | 64.96 | 65.26 | 73.68 |
| 3. Ability to plan activities, carry them out and self-monitor | 51.82 | 51.58 | 73.68 |
| 4. Initiative to start tasks independently and complete them | 49.64 | 53.68 | 72.63 |
| 5. Speed of thinking when responding to questions or general reaction to novel situations | 72.26 | 71.58 | 78.95 |
| 6. Emotional status | 67.15 | 65.26 | 77.89 |
| 7. Sensitivity | 46.72 | 43.16 | 53.68 |
| 8. Alcohol and drug use | 15.33 | 12.63 | 14.74 |
| 9. Social and interpersonal skills | 48.91 | 46.32 | 56.84 |
| 10. Emotional tolerance to stress | 63.50 | 58.95 | 73.68 |
| 11. Relationship to family members and close friends | 38.69 | 35.79 | 37.89 |
| 12. Physical and emotional endurance | 73.72 | 75.79 | 80.00 |
| 13. Physical skills necessary for work, play, and self-care | 67.88 | 65.26 | 74.74 |
| 14. Potential for job placement or return to a former job | 67.15 | 62.11 | 77.89 |
| **Average Number of Behaviors Identified as Worsened** | **7.99** | **7.76** | **9.20** |
| **Comparison of Ratings Provided by Individual and Others (n= 95)** | | | |
| Rate of Agreement Behavior by Behavior (item by item) | | | **75.41** |
| Correlation of Total Behaviors Identified as Worsened (total problems) | | | .483 |
| Correlation | | | .001 |
| p-level (2-tail) | | | |
| Paired t-test for total behaviors (total problems) | | | |
| Mean Difference Between Individual and Significant Other | | | **-1.4421** |
| t-value | | | -4.07 |
| p-level (2-tail) | | | .001 |

[2]N = the total number of profiles completed and used to compute percents responding to each item or profile. The "n" in parenthesis is the number of profiles used to compute percents, means, or medians for each item alternative.

[3]Problems were identified by 97.84 percent of persons on this profile. Items 15 and 16 were open-ended descriptions of skills, abilities, and hobbies.

**Table IV-4. Comparison of Problems Identified by Individual and a Significant Other on the Personal Demographic Interview (N Pairs = 95)**

| Problems Identified by Individual and Significant Other | Percents Mean[1] | S.D. | Mean Differences | Comparisons r | t | p |
|---|---|---|---|---|---|---|
| Number of Problems Identified (Count) | 7.75<br>9.20 | 3.370<br>3.416 | -1.44 | .483 | -4.07 | .000 |
| 1. Learns/Recalls New Information | 68.42<br>73.68 | 46.730<br>44.268 | -5.26 | .468 | -1.09 | .278 |
| 2. Memory for Routine Tasks | 65.26<br>73.68 | 47.866<br>44.268 | -8.42 | .468 | -1.72 | .088 |
| 3. Plans or Carries Out Activities | 51.57<br>73.68 | 50.240<br>44.268 | -22.10 | .330 | -3.92 | .000 |
| 4. Starts and Completes Tasks | 53.68<br>72.63 | 50.129<br>44.821 | -18.94 | .471 | -3.77 | .000 |
| 5. Speed of Thinking | 71.57<br>78.94 | 45.343<br>40.985 | -7.36 | .591 | -1.83 | .070 |
| 6. Emotional Status | 65.26<br>77.89 | 47.866<br>41.716 | -12.63 | .411 | -2.52 | .014 |
| 7. Sensitivity | 43.15<br>53.68 | 49.792<br>50.129 | -10.52 | .511 | -2.08 | .041 |
| 8. Alcohol and/or Drug Abuse | 12.63<br>14.73 | 33.397<br>35.635 | -2.10 | .646 | -.71 | .482 |
| 9. Social and Personal Skills | 46.31<br>56.84 | 50.129<br>49.792 | -10.52 | .468 | -1.99 | .049 |
| 10. Tolerance for Stress | 58.94<br>73.68 | 49.454<br>44.268 | -14.73 | .425 | -2.85 | .005 |
| 11. Relationship with Family/Friends | 35.78<br>37.89 | 48.192<br>48.770 | -2.10 | .367 | - .38 | .708 |
| 12. Physical/Emotional Endurance | 75.78<br>80.00 | 43.063<br>40.212 | -4.21 | .270 | - .82 | .417 |
| 13. Skills for Work, Play, Self-Care | 65.26<br>74.73 | 47.866<br>43.683 | -9.47 | .441 | -1.90 | .060 |
| 14. Potential to Get Job | 62.10<br>77.89 | 48.770<br>41.716 | -15.78 | .368 | -3.01 | .003 |

[1]Means and standard deviations are in the following order: First line is Individual's report; second line is Significant Other's report.

## Table IV-5. Summary of General and Job Goal Specific Problem Areas Identified on the Physical Profile (N = 149)[4]

| Primary Variables and Traits on the Physical Profile | Percentages of Individuals for Whom Problem Was Indicated (n = 139) | | |
|---|---|---|---|
| | General Problem | Job Specific Problem | Trait Identified as Contributing Factor |
| **1. Physical Capacity** | **71.22** | **51.08** | |
| Strength and stamina | | | 61.15 |
| Weakness/lifting limitations | | | 60.43 |
| Fatiguability - endurance | | | 59.71 |
| **2. Movement Skills** | **61.15** | **40.29** | |
| Ambulation | | | 53.24 |
| Gross motor coordination | | | 51.08 |
| Facial muscle control | | | 22.30 |
| Range of motion/contractures | | | 41.01 |
| Paralysis/palsy | | | 39.57 |
| **3. Adroitness** | **59.71** | **40.29** | |
| Fine motor coordination | | | 61.87 |
| Dexterities (finger, manual, etc.) | | | 58.27 |
| **4. Sensory Perception** | **18.71** | **10.79** | |
| Pain perception | | | 20.14 |
| Numbness | | | 18.71 |
| Hot/cold/light touch sensation | | | 13.67 |
| **5. Sensory Systems** | **56.83** | **26.62** | |
| Vision system problems | | | 41.01 |
| Hearing (tinnitus, noise sensitivity) | | | 17.99 |
| Smell and taste | | | 14.39 |
| Balance/dizziness or vertigo | | | 44.60 |
| Hemi-spatial neglect | | | 19.42 |
| **6. Chemical Abuse** | **24.46** | **14.39** | |
| Prescription drugs | | | 15.11 |
| Alcohol | | | 34.53 |
| Street drugs | | | 18.71 |
| Other chemical abuse | | | 13.67 |

[4]N = the total number of profiles completed and used to compute percents responding to each item or profile. The "n" in parenthesis is the number of profiles used to compute percents, means, or medians for each item alternative.

| Primary Variables and Traits on the Physical Profile | Percentages of Individuals for Whom Problem Was Indicated (n = 139) | | |
|---|---|---|---|
| | General Problem | Job Specific Problem | Trait Identified as Contributing Factor |
| **7. Chronic Pain Issues** | **28.06** | **21.58** | |
| Back or neck | | | 19.42 |
| Headaches | | | 20.14 |
| General somatic complaints and fatigue | | | 19.42 |
| Other pain problems | | | 20.86 |
| Musculoskeletal problems | | | 15.83 |
| **8. Other Issues** | **23.02** | **12.23** | |
| Diabetes | | | 15.11 |
| Cardiovascular problems | | | 15.83 |
| Respiration/breathing | | | 12.95 |
| Skin conditions | | | 12.95 |
| Hydrocephalus/shunting | | | 12.23 |
| Swallowing | | | 13.67 |
| Heterotopic ossification | | | 11.51 |
| Awareness of body position in space | | | 15.83 |
| Epilepsy | | | 19.42 |

## Table IV-6. Summary of General and Job Goal Specific Problems Identified on the Social-Emotional Profile (N = 149)[5]

| Variables and Traits from the Social-Emotional Variables Profile | Percentages of Individuals for Whom Problems Were Indicated (n = 131) | | |
|---|---|---|---|
| | General Problem | Job Specific Problem | Trait Identified as Contributing Factor |
| **1. Social Adjustment** | **73.28** | **52.67** | |
| Age appropriate maturity | | | 51.91 |
| Concern for others | | | 37.40 |
| Acceptable activity level | | | 38.93 |
| Social appropriateness/common sense | | | 60.31 |
| Accuracy of self-appraisal | | | 64.12 |
| **2. Emotional Stability** | **63.36** | **38.17** | |
| Temper/explosiveness | | | 42.75 |
| Anger expression | | | 44.27 |
| Apathetic attitude | | | 32.82 |
| Excessive complaints | | | 34.35 |
| Tolerance of minor frustrations | | | 51.15 |
| Appropriate emotions displayed | | | 45.04 |
| **3. Intrusiveness** | **38.93** | **26.72** | |
| Verbal aggressiveness | | | 37.40 |
| Physical intrusiveness/assaultiveness | | | 24.43 |
| Sexual appropriateness | | | 35.88 |
| Impulsive behavior or speech | | | 48.85 |
| **4. Activity Level** | **55.73** | **36.64** | |
| Spontaneity | | | 29.01 |
| Initiative to work | | | 47.33 |
| Isolation or withdrawal | | | 41.22 |
| Enthusiasm/drive | | | 42.75 |
| Appropriate activity level | | | 41.98 |
| **5. Suspected Chemical Use Problems** | **32.82** | **22.14** | |
| Prescription drug side effects | | | 24.43 |
| Alcohol related problems | | | 44.27 |
| Other substance abuse problems | | | 29.01 |

[5]N = the total number of profiles completed and used to compute percents responding to each item or profile. The "n" in parenthesis is the number of profiles used to compute percents, means,or medians for each item alternative.

## Table IV-7. Summary of General and Job Goal Specific Problems Identified on the Neuropsychological Profile (N=149)[6]

| Primary Variables and Traits from the Neuropsychological Profile | Percentages of Individuals for Whom Problems Were Indicated (n= 143) | | |
|---|---|---|---|
| | General Problem | Job Specific Problem | Trait Identified as Contributing Factor |
| **1. Freedom From Distractibility** | **76.92** | **60.14** | |
| Alertness | | | 30.77 |
| Vigilance | | | 26.57 |
| Attention and concentration | | | 70.63 |
| Mental calculation skills | | | 41.26 |
| Immediate verbal recall | | | 49.65 |
| **2. Intellectual Verbal Factors** | **68.53** | **44.06** | |
| General fund of information | | | 36.36 |
| Abstraction skills | | | 50.35 |
| Arithmetic reasoning | | | 43.36 |
| Vocabulary (work knowledge) | | | 41.26 |
| Common sense and social reasoning | | | 51.75 |
| **3. Intellectual Performance Factors** | **70.63** | **50.35** | |
| Visual organization skills | | | 48.95 |
| Perceptual organization and reasoning | | | 53.15 |
| Spatial relations - form perception | | | 42.66 |
| Attention to complex visual detail | | | 56.64 |
| Visual scanning skills | | | 46.85 |
| **4. Immediate and Delayed Memory** | **72.73** | **58.04** | |
| Auditory/verbal | | | 59.44 |
| Visual/nonverbal | | | 49.65 |
| Procedural/skill | | | 31.47 |
| Design or figure | | | 30.77 |
| **5. Other Memory Skills** | **48.25** | **30.77** | |
| Prospective (future) | | | 38.46 |
| Remote (historical) | | | 45.45 |

[6]N = the total number of profiles completed and used to compute percents responding to each item or profile. The "n" in parenthesis is the number of profiles used to compute percents, means, or medians for each item alternative.

| Primary Variables and Traits from the Neuropsychological Profile | Percentages of Individuals for Whom Problems Were Indicated (n= 143) | | |
|---|---|---|---|
| | General Problem | Job Specific Problem | Trait Identified as Contributing Factor |
| **6. Communication Skills** | **67.83** | **44.06** | |
| Following verbal directions | | | 41.26 |
| Written expression | | | 51.05 |
| Goal directed speaking | | | 32.17 |
| Understandability of speech | | | 37.06 |
| Voice volume | | | 30.77 |
| Speaking vocabulary | | | 33.57 |
| **7. Psycho-Motor Skills** | **61.54** | **43.36** | |
| Simple assembly | | | 36.36 |
| Gross motor | | | 49.65 |
| Visual-perceptual-motor | | | 43.36 |
| Drawing and writing | | | 46.15 |
| Other fine motor skills | | | 54.55 |
| **8. Executive and Higher Order Skills** | **88.11** | **69.93** | |
| Planning and goal formation | | | 50.35 |
| Problem solving | | | 55.24 |
| Insightfulness | | | 52.45 |
| Decision making | | | 41.96 |
| Cognitive flexibility | | | 49.65 |
| Anticipation of problems | | | 43.36 |
| Self-regulation | | | 41.96 |
| Self-awareness | | | 37.06 |
| Information processing speed | | | 53.85 |
| Awareness of limitations | | | 52.45 |
| Judgment | | | 49.65 |
| **9. Other Cognitive Variables** | **58.74** | **44.06** | |
| Perseveration tendencies | | | 32.87 |
| Hemi-spatial neglect | | | 24.48 |
| Inattention (auditory, visual, tactile) | | | 37.76 |
| Tactile object and shape recognition | | | 15.38 |
| Mental flexibility | | | 44.06 |
| Stimulus bound behavior | | | 18.88 |
| **10. General Mental Health Issues** | **37.06** | **27.27** | |
| Confused thinking | | | 32.17 |
| Unusual content or form of thought | | | 23.08 |
| Self-centered or childlike behaviors | | | 43.36 |
| Disinhibition | | | 43.36 |

| Primary Variables and Traits from the Neuropsychological Profile | Percentages of Individuals for Whom Problems Were Indicated (n= 143) | | |
|---|---|---|---|
| | General Problem | Job Specific Problem | Trait Identified as Contributing Factor |
| **11. Affective Mental Health Issues** | **45.45** | **31.47** | |
| Depression, dysphoria | | | 47.55 |
| Anxiety or panic feelings | | | 38.46 |
| Emotionally labile (moody) | | | 35.66 |
| Manic, hyperactive, or hypomanic | | | 20.98 |
| **12. Psychotic Mental Health Issues** | **7.69** | **9.09** | |
| Auditory or visual hallucinations | | | 14.69 |
| Suspicious, guarded, paranoid behavior | | | 20.98 |
| Delusions or overvalued ideas | | | 20.28 |
| **13. Maladaptive Personality Variables** | **29.37** | **23.08** | |
| Antisocial tendencies | | | 25.17 |
| Pervasive behavior dyscontrol | | | 20.28 |
| Passive, obsessive, compulsive features | | | 31.47 |
| Borderline or histrionic features | | | 16.08 |
| Other personality disturbances | | | 23.78 |

## Table IV-8. Summary of Job Search Problems (N = 139)[7]

| Skills Identified on the Job Search Profile | Percents Reporting Problems (n = 139) |
|---|---|
| 1. Identifies reasonably obtainable job goals | 53.24 |
| 2. Is able to produce typed letters for employment search | 60.43 |
| 3. Demonstrates knowledge of how to make initial employer contacts | 38.85 |
| 4. Demonstrates knowledge of how to comprehensively canvass the community to search for employment | 51.80 |
| 5. Is able to track job leads and employer contacts for follow-up | 48.20 |
| 6. Plans on spending an adequate and consistent effort in searching for employment | 51.08 |
| 7. Is able to provide the names, addresses, and phone numbers of personal and work references upon request | 45.32 |
| 8. References can support the fact that the person possesses the skills and ability to perform targeted job goals | 44.60 |
| 9. Can describe disability or limitations in a functional and nonstigmitizing manner | 62.59 |
| 10. Has access to reliable transportation to interviews and work | 30.22 |

[7]N = the total number of profiles completed and used to compute percents responding to each item or profile. The "n" in parenthesis is the number of profiles used to compute percents, means, or medians for each item alternative.

## Table IV-9. Summary of Problems Identified in Interviewing Skills (N = 149)[8]

| Skills Identified on the Interviewing Skills Profile | Percents Reporting Problems (n = 130) |
|---|---|
| 1. Uses telephone to inquire about jobs | 43.85 |
| 2. Uses appropriate telephone demeanor and language | 40.77 |
| 3. Arrives on time, presents self adequately, and waits appropriately before the interview | 18.46 |
| 4. Has a well organized, neatly typed resume that reflects previous training and work experience | 58.46 |
| 5. Can independently fill out job application neatly and completely | 62.31 |
| 6. Enters the interview appropriately and demonstrates good initial impression | 28.46 |
| 7. Demonstrates an assertive and purposeful personal approach (e.g., eye contact, firm handshake) without being overbearing | 36.92 |
| 8. Expresses a general knowledge of the job and the company in which employment is sought | 51.54 |
| 9. Positively relates background, training, and/or work experience as a qualification for the intended job | 53.08 |
| 10. Avoids making negative remarks about present or former employers | 25.38 |
| 11. Answers open-ended general questions | 50.00 |
| 12. Explains employment difficulties appropriately (e.g., past employment problems or gaps in employment history) | 46.92 |
| 13. Deals with sensitive material or problem areas in a positive, constructive manner | 58.46 |
| 14. Can appropriately request information on wages and benefits | 41.54 |
| 15. Ability to keep pace and place in the interview | 39.23 |
| 16. Demonstrates courtesy and thanks the interviewer(s) | 13.08 |

[8]N = the total number of profiles completed and used to compute percents responding to each item or profile. The "n" in parenthesis is the number of profiles used to compute percents, means, or medians for each item alternative.

## Table IV-10. Summary of Problems Identified in Critical Work Behaviors (N = 149)[9]

| Critical Work Behaviors from the Profile | Percents Reporting Problems (n = 134) |
|---|---|
| 1. Follows shop rules and regulations, including safety | 21.64 |
| 2. Quality of work | 28.36 |
| 3. Demonstrates knowledge of job | 14.93 |
| 4. Remembers work instructions | 44.03 |
| 5. Work productivity and work pace | 56.72 |
| 6. Dexterity in relation to desired job goal | 38.06 |
| 7. Follows through on work tasks to completion | 20.15 |
| 8. Punctuality at start of work and after breaks | 24.63 |
| 9. Attends work daily and calls with reasonable excuse for absences | 19.40 |
| 10. Demonstrates a practical approach to solving work problems | 44.78 |
| 11. Organization of work and related materials | 29.10 |
| 12. Looks for things to do to keep busy during slow times | 36.57 |
| 13. Potential to advance on the job and assume new responsibilities | 54.48 |
| 14. Requests assistance when needed | 21.64 |
| 15. Skill development in relation to job demands | 29.85 |
| 16. Work stamina | 43.28 |
| 17. Displays an appropriate awareness of surroundings and activities in the immediate vicinity | 14.18 |
| 18. Expresses self clearly and efficiently | 35.82 |
| 19. Displays the ability to be appropriately assertive and stand up for oneself | 35.07 |
| 20. Exhibits enthusiasm appropriately giving the impression of being motivated to work | 24.63 |
| 21. Demonstrates adequate grooming and hygiene | 13.43 |
| 22. Delays immediate desires in order to work for longer term goals | 32.09 |
| 23. Demonstrates a desire and/or need to work | 20.90 |
| 24. Reads instructions, memos, etc. | 29.10 |
| 25. Performs simple math on the job such as counting, estimating, solving simple problems, measuring, etc. | 26.87 |
| 26. Has a network of friends, relatives, and other contacts to assist in locating work and provide necessary support | 27.61 |
| 27. Follows supervisor's work instructions accurately | 29.10 |
| 28. Works independent of the supervisor after an initial training period | 22.39 |

[9]N = the total number of profiles completed and used to compute percents responding to each item or profile. The "n" in parenthesis is the number of profiles used to compute percents, means, or medians for each item alternative.

## Table IV-11. Summary of Problems Identified in Social Adaptivity (N = 149)[10]

| Skills Identified on the Social Skills Profile | Percents Reporting Problems (n=115) |
|---|---|
| 1. Refrains from complaining about co-workers, supervisors, work tasks | 26.09 |
| 2. Cooperates with supervisors | 20.87 |
| 3. Establishes appropriate relationships with supervisors | 21.74 |
| 4. Profits from instruction or criticism | 48.70 |
| 5. Demonstrates respect for the authority of supervisors | 18.26 |
| 6. Demonstrates courtesy to other workers | 9.57 |
| 7. Maintains proper posture and distance from others during conversations | 13.91 |
| 8. Demonstrates appropriate volume of voice | 22.61 |
| 9. Displays appropriate expression of emotion | 38.26 |
| 10. Displays acceptable morals and ethics on the job | 13.91 |
| 11. Is accepted by co-workers | 18.26 |
| 12. Maintains a realistic opinion of achievements and abilities | 61.74 |
| 13. Handles minor work stress and frustrations on the job | 53.04 |
| 14. Demonstrates swings in mood, unpredictable behavior | 28.70 |
| 15. Boldness presents a problem in social situations | 25.22 |
| 16. Refrains from making others feel uncomfortable because of actions, physical appearance, or general conduct (e.g., inappropriate body movement, staring) | 20.87 |
| 17. Demonstrates an awareness and sensitivity to the feelings of others (e.g., knows when to end a conversation, when not to disturb others) | 33.91 |
| 18. Cooperates with co-workers | 11.30 |
| 19. Refrains from making others uncomfortable by awkward comments or out of context, inappropriate remarks | 28.70 |
| 20. Displays facial expression appropriate to the situation | 17.39 |
| 21. Distracts or disturbs others at work | 21.74 |
| 22. Offers acceptable excuses for inappropriate behaviors if necessary | 29.57 |
| 23. Views outcome of events as controllable and determined by actions on the job (e.g., effort expended or skills rather than merely luck) | 33.91 |
| 24. Attitudes of family or parents interfere with employment efforts | 24.35 |

[10]N = the total number of profiles completed and used to compute percents responding to each item or profile. The "n" in parenthesis is the number of profiles used to compute percents, means, or medians for each item alternative.

## Table IV-12. Strategies Used in Evaluation (N = 149)[11]

| Program Path and Evaluation Strategies | Percents Reporting Strategy |
|---|---|
| **1. Current Status (n = 138)** | **92.62** |
| New to this program | 68.84 |
| Currently in other program in this facility | 31.16 |
| **2. Referrals (n = 123)** | **82.55** |
| Refer for immediate employment services | 38.21 |
| Refer for employment preparation services | 49.59 |
| Refer to other agency if vocational rehabilitation not appropriate at this time | 24.39 |
| **3. Type of Evaluation Conducted (n = 142)** | **95.30** |
| Return-to-work assessment | 38.03 |
| Comprehensive vocational evaluation | 65.49 |
| Specific behavioral assessment | 14.08 |
| Baseline behavioral assessment | 7.75 |
| Vocational readiness assessment | 35.92 |
| **4. Evaluation Methods Used (n = 140)** | **93.96** |
| Work sample | 65.00 |
| Situational assessment (facility-based) | 70.71 |
| Community-based work site assessment | 34.29 |
| Psychometric assessment | 50.00 |
| Other | 10.00 |
| **5. Severity of Vocational Limitations in Relation to Targeted Job Goal (n = 141)** | **94.63** |
| No limitations in relation to targeted job goal | 4.96 |
| Mild vocational limitations | 30.50 |
| Moderate vocational limitations | 33.33 |
| Severe vocational limitations | 26.24 |
| Profound vocational limitations | 4.96 |

[11]N = the total number of profiles completed and used to compute percents responding to each item or profile. The "n" in parenthesis is the number of profiles used to compute percents, means, or medians for each item alternative.

## Table IV-13. Identified Service Needs From Structural Summary (N = 149)[12]

| Service Needs Identified on Vocational Needs Inventory | Percent Reporting Need |
|---|---|
| **1. Medical Related Services (n = 132)** | **49.66** |
| Pre-employment physical | 16.67 |
| Therapy: OT, PT, Speech | 25.76 |
| Physical restoration | 9.09 |
| Medication management | 20.45 |
| Alcohol and drug treatment | 15.91 |
| Prosthetic appliances | 1.52 |
| Other | 4.55 |
| **2. Assessments (n = 132)** | **67.79** |
| Vocational evaluation | 36.36 |
| Community-based situational assessment | 41.67 |
| Neuropsychological consultation | 27.27 |
| Vocational interest or aptitude testing | 28.03 |
| Psychiatric evaluation | 7.58 |
| Alcohol and drug assessment | 19.70 |
| Employment interview assessment | 27.27 |
| Other | 4.55 |
| **3. Psychotherapeutic or Counseling Services (n = 132)** | **68.46** |
| Psychotherapy or crisis intervention | 25.00 |
| Vocational guidance | 54.55 |
| Case management | 40.91 |
| Alcohol/chemical dependency treatment | 10.61 |
| Other | 2.27 |
| **4. Job Site Services (n = 132)** | **84.56** |
| Employer education | 67.42 |
| Client advocacy | 49.24 |
| Job site assessment | 53.79 |
| Post employment follow-up | 56.82 |
| Job site intervention | 40.15 |
| Post employment job upgrading | 12.88 |
| Return to work trial | 31.82 |
| Transportation to work | 34.85 |
| Mobility training | 9.85 |
| Job coaching | 78.03 |
| Rehabilitation technology evaluation | 12.88 |
| Work site accommodations | 32.58 |
| Other | 4.55 |

[12]N = the total number of profiles completed and used to compute percents responding to each item or profile. The "n" in parenthesis is the number of profiles used to compute percents, means, or medians for each item alternative.

| Service Needs Identified on Vocational Needs Inventory | Percent Reporting Need |
|---|---|
| **5. Preparation for Work Services (n = 132)** | **77.85** |
| Occupation exploration | 30.30 |
| Work adjustment | 32.58 |
| Work hardening | 33.33 |
| Vocational training | 23.48 |
| Transitional sheltered employment | 23.48 |
| Apprenticeship-traineeship-internship | 18.94 |
| Job seeking skills class | 37.88 |
| Job club | 24.24 |
| Job shadowing | 19.70 |
| Subsidized employment | 10.61 |
| Interview training | 45.45 |
| Informational interview | 16.67 |
| Telephone inquiry interview | 20.45 |
| Application review | 28.03 |
| Job interview | 36.36 |
| Job matching | 25.76 |
| Job placement | 43.94 |
| Selective job placement | 34.85 |
| Other | 2.27 |
| **6. Miscellaneous Other Needs (n = 132)** | **5.37** |
| Special wage certificate | 5.30 |
| Work permit | .76 |

## Table IV-14. Reliability Analysis for Vocational Assessment Protocols: Dichotomous and Clinical Scaling[1]

| Profiles | Counts for Profiles | | Reliability[2] | |
|---|---|---|---|---|
| | Items | People | Dichotomized Scaling | Clinical Scaling |
| **Demographics Profiles** | | | | |
| B. Interview (Self) | 14 | 137 | .776 | .824 |
| B. Interview (Other) | 14 | 103 | .834 | .875 |
| **Non-Vocational Profiles** | | | | |
| **General Problem of Limitations** | | | | |
| C. Physical | 8 | 139 | .343 | .519 |
| D. Social | 5 | 131 | .377 | .606 |
| E. Neuropsychological | 13 | 143 | .732 | .806 |
| **Limitation Related to Job Goal** | | | | |
| C. Physical | 8 | 139 | .656 | .656 |
| D. Social | 5 | 131 | .739 | .739 |
| E. Neuropsychological | 13 | 143 | .822 | .822 |
| **Vocational Profiles** | | | | |
| F. Job Seeking Skills | 10 | 139 | .793 | .876 |
| G. Interviewing Skills | 16 | 130 | .875 | .922 |
| H. Critical Work Behaviors | 28 | 134 | .889 | .915 |
| I. Social Adaptive Behaviors | 24 | 115 | .918 | .938 |

Table Notes:

[1] In 2-point scaling, 100 = has limitation, 0 = no reported limitation. Under 3-point scaling for Non-Vocational Profiles, 2 = significant limitation, 1 = modest limitation, and 0 = no limitation reported. Under Vocational Profiles, scaling goes from 1 to 5, with 1 = has significant limitation.

[2] Alpha is a measure of reliability (internal consistency of responses to items within a scale). Standardized alpha values are reported.

## Table IV-15. Principal Components Factor Analyses on Vocational Assessment Protocol Profiles: Clinical Ratings Scaling

| Profiles | Counts for Profiles | | Eigen Values | | Item Loading on Factors | | | | Factors to Account for 75 Percent of Variance |
|---|---|---|---|---|---|---|---|---|---|
| | Items | People | Greater Than 1.0 | Percent of Variance Accounted For | Single Factor | Two Factors | Three Factors | Four or More | |
| **Demographics Profiles** | | | | | | | | | |
| B. Interview (Self) | 14 | 137 | 3 | 53.1 | 9 | 8 | NA | NA | 7 |
| **Non-Vocational Profiles General Limitation** | | | | | | | | | |
| C. Physical | 8 | 139 | 2 | 50.0 | 4 | 4 | 1 | 0 | 5 |
| D. Social | 5 | 131 | 2 | 64.9 | 4 | 1 | 1 | 1 | 4 |
| E. Neuropsychological | 13 | 143 | 4 | 62.0 | 9 | 5 | 4 | 2 | 82 |
| Combined Profiles | 26 | 119 | 17 | 75.2 | 10 | 6 | 6 | 5 | 17 |
| **Vocational Profiles** | | | | | | | | | |
| F. Job Seeking Skills | 10 | 139 | 2 | 59.8 | 10 | 3 | 2 | 2 | 5 |
| G. Interviewing Skills | 16 | 130 | 3 | 62.4 | 16 | 4 | 2 | 2 | 7 |
| H. Critical Work Behaviors | 28 | 134 | 7 | 65.2 | 18 | 11 | 8 | 2 | 12 |
| I. Social Adaptive Behaviors | 24 | 115 | 6 | 70.2 | 23 | 4 | 3 | 3 | 9 |
| Combined Profiles | 78 | 96 | 23 | 73.5 | 28 | 24 | 22 | 18 | 24 |

# V. Bibliography


Abrams, D., & Haffey, W. (1991). Blueprint for success in vocational restoration: The work re-entry program. In B. McMahon & L. Shaw (Eds.), *Work worth doing: Advances in brain trauma rehabilitation* (pp. 221-244). Orlando, FL: Paul M. Deutsch Company.

American Association of Mental Deficiency (AAMD). (1978). *Manual on terminology and classification in mental retardation*. Washington, DC: Author (Series Three).

Annegers, J. F., Grabow, J. D., & Kurland, L. T. (1980). The incidence, causes, and secular trends of head trauma in Olmstead County, Minnesota, 1935-1974. *Neurology, 30*, 912-919.

Aronow, H. (1987). Rehabilitation effectiveness with severe brain injury: Translating research into policy. *Journal of Head Trauma Rehabilitation, 2*(3), 24-36.

Bartlow, C. L., & Moore, R. (1988, Winter/Spring). Returning to work considerations for persons who are traumatically brain injured. *Journal of Job Placement*, 21-26.

Ben-Yishay, Y., Silver, S., Piasetsky, E., & Rattok, J. (1987). Relationship between employability and vocational outcome after intensive holistic cognitive rehabilitation. *Journal of Head Trauma Rehabilitation, 2*(1), 35-48.

Botterbusch, K. F. (1989). *Understanding community based employment and follow-up services*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Brooks, N., Campsie, L., Symington, C., Beattie, A., & McKinlay, W. (1987). The effects of severe head injury on patient and relatives within seven years of injury. *Journal of Head Trauma Rehabilitation, 2*(3), 1-13.

Chan, F., Dial, J., Schleser, R., McMahon, B., Shaw, L., Marme, M., & Lam, C. (1991). The ecological approach to vocational evaluation. In B. McMahon & L. Shaw (Eds.) *Work worth doing: Advances in brain injury rehabilitation* (pp. 117-133). Orlando, FL: Paul M. Deutsch Company.

Coker, C. (1991). *ADAPT final report*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Coker, C. C. (1992). *Testing the community transition center model project*. Final report on the three-year community transition center model. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Cook, J. V. (1990). Returning to work after traumatic head injury. In M. Rosenthal, E. Griffith, M. Bond, & J. Miller (Eds.), *Rehabilitation of the adult and child with traumatic brain injury*. Philadelphia, PA: F. A. Davis.

Corthell, D. (Ed.). (1990). *Traumatic brain injury and vocational rehabilitation*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Crewe, N., & Athelstan, G. (1981). *The functional assessment inventory*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Materials Development Center.

DeBoskey, D. S., Oleson, T., Dunse, C., & Morin, K. (1986). *Hiring the head-injured: What to expect*. Tampa, FL: DeBoskey and Associates.

Devany, C. W., Kreutzer, J. S., Galberstadt, L. F., & West, D. D. (1991). Referrals for supported employment after brain injury: Neuropsychological, behavioral, and emotional characteristics. *Journal of Head Trauma Rehabilitation*, *6*(3), 59-70.

Dikmen, S. (1989, Spring). Employability of head injury survivors. *Rehabilitation: Traumatic brain injury update*, 1 & 4.

Ezrachi, O., Ben-Yishay, Y., Kay, T., Diller, L., & Rattok, J. (1991). Predicting employment in traumatic brain injury following neuropsychological rehabilitation. *Journal of Head Trauma Rehabilitation*, *6*(3), 71-84.

Fawber, H., & Wachter, J. (1987). Job placement as a treatment component of the vocational rehabilitation process. *Journal of Head Trauma Rehabilitation*, *2*(1), 27-33.

Fourteenth Institute on Rehabilitation Issues. (1987). *The use of vocational evaluation in VR*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Fraser, R. T. (1991). Vocational evaluation. *Journal of Head Trauma Rehabilitation*, *6*(3), 46-58.

Haffey, W. J., & Abrams, D. L. (1991). Employment outcomes for participants in a brain injury work reentry program: Preliminary findings. *Journal of Head Trauma Rehabilitation*, *6*(3), 24-34.

Jacobs, H. (1987). The Los Angeles head injury survey: Project rationale and design implications. *Journal of Head Trauma Rehabilitation*, *2*(3), 37-50.

Kaplan, S. P. (1988). Adaptation following serious brain injury: An assessment after one year. *Journal of Applied Rehabilitation Counseling*, *19*(3), 3-8.

Kay, T. (1993). Selection and outcome criteria for community-based employment: Perspectives, methodological problems and options. In D. Thomas, F. Menz, & D. McAlees (Eds.), *Community-based employment following traumatic brain injury* (pp. 29-56). Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Kay, T., & Lezak, M. (1990). The nature of head injury. In D. Corthell (Ed.), *Traumatic brain injury and vocational rehabilitation* (pp 21-66). Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Kay, T., & Silver, S. M. (1988). The contribution of the neuropsychological evaluation to the vocational rehabilitation of the head-injured adult. *Journal of Head Trauma Rehabilitation*, *3*(1), 65-76.

Krankowski, T., & Culbertson, D. (1993). Vocational assessment of individuals with traumatic brain injury. *The issues papers: National forum on issues in vocational assessment* (pp. 243-249). Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Materials Development Center.

Kreutzer, J. S., Harris Marwitz, J., & Wehman, P. H. (1991). Substance abuse assessment and treatment in vocational rehabilitation for persons with brain injury. *Journal of Head Trauma Rehabilitation*, *6*(3), 12-21.

Levin, H. S., Ben, A. L., & Grossman, R. G. (1982). *Neurobehavioral consequences of closed head injury*. New York: Oxford University Press.

Lezak, M. (1987). Relationships between personality disturbances, social disturbances, and physical disability following traumatic brain injury. *Journal of Head Trauma Rehabilitation*, *2*, 57-69.

Linge, F. R. (1980, September). What does it feel like to be brain damaged? *Canada's Mental Health*.

Mahaffey, D., & Ridgely, M. (1991). Supported employment and the vocational restoration process. In B. McMahon & L. Shaw (Eds.), *Work worth doing: Advances in brain trauma rehabilitation* (pp. 169-200). Orlando, FL: Paul M. Deutsch Company.

Millis, S. R., Rosenthal, M., & Lourie, I. F. (1994, December). Predicting community integration after traumatic brain injury with neuropsychological measures. *International Journal of Neuroscience*, *79*, 34, 165-167.

Musante, S. E. (1983). Issues relevant to the vocational evaluation of the traumatically head-injured client. *Vocational Evaluation and Work Adjustment Bulletin*, *9*, 45-68.

Nadolsky, J. (1985). Vocational evaluation: An experimental trend in assessment. In C. Smith & R. Fry (Eds.), *The issues papers: National forum on issues in vocational assessment*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Materials Development Center.

National Head Injury Foundation. (1992). *The NHIF and you: National Head Injury Foundation*. Washington, DC: Author.

Parente, K., Stapleton, M. C., & Wheatley, C. J. (1991). Practical strategies for vocational re-entry after traumatic brain injury. *Journal of Head Trauma Rehabilitation, 6*(3), 35-45.

Peterson, J., & Foss, G. (1980). *An identification of social/interpersonal skills relevant to job tenure for mentally retarded adults*. Eugene: Oregon University, Rehabilitation Research and Training Center in Mental Retardation.

Pruitt, W. (1977). *Vocational evaluation*. Menomonie, WI: Walt Pruitt Associates.

Rimel, R. W., Giordani, B., Barth, F. T., Bull, T. F., & Jane, J. A. (1981). Disability caused by minor head injury. *Neurosurgery, 9*(3), 221-228.

Roush, B. K. (1989). *An investigation of the functional limitations of persons with traumatic brain injuries (TBI)*. Unpublished master's thesis, University of Wisconsin-Stout, Menomonie.

Sale, P., West, M., Sherron, P., & Wehman, P. H. (1991). Exploratory analysis of job separations from supported employment for persons with traumatic brain injury. *Journal of Head Trauma Rehabilitation, 6*(3), 1-11.

Savage, R., & Wolcott, G. (1994). *Educational dimension of acquired brain injury*. Austin, TX: Pro-Ed.

Thomas, D. F. (1983). *The construction and validation of the vocational adaptivity scale*. Unpublished doctoral dissertation, Marquette University, Milwaukee, WI.

Thomas, D. F. (1988). *Vocational adaptivity scale (VAS)*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Thomas, D. F. (1989, Summer). Vocational evaluation of people with traumatic brain injury. *Vocational Evaluation and Work Adjustment Bulletin, 22*(2), 57-64.

Thomas, D. F. (1990). *Neuropsychological variables profile*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Thomas, D. F. (1990). *Physical variables profile*. Menomonie: University of Wisconsin, Stout Vocational Rehabilitation Institute, Research and Training Center.

Thomas, D. F. (1990). Vocational evaluation of persons with traumatic brain injury. In D. Corthell (Ed), *Traumatic brain injury and vocational rehabilitation*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Thomas, D. F. (1994). *Vocational assessment protocol (VAP)*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Thomas, D. F. (1996). *The vocational assessment protocol user's manual*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Thomas, D. F., Coker, C., & Menz, F. (1988). *Implementation manual*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Thomas, D. F., Czerlinsky, T., & Smigielski, J. (1987). *Wisconsin survey of traumatic head injuries: An assessment of rehabilitation needs, and social, economic and personal loss: A preliminary report*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Thomas, D. F., Czerlinsky, T., & Smigielski, J. (1990). *A report of vocational, economic, personal losses following traumatic brain injury*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Thomas, D. F., Hanson, G., & Menz, F. (1991, October). *The vocational assessment protocol: An assessment of the employment-related needs of individuals with traumatic brain injuries and related disabilities in community-based employment*. Poster presented at national conference on Community-Based Employment of Persons With Traumatic Brain Injury: Theory and Practice, Philadelphia, PA.

Thomas, D. F., & McCray, P. M. (1988). *Employment readiness assessment (ERA)*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Thomas, D. F., & Menz, F. (1988). *TBI variables compendium*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Thomas, D. F., & Menz, F. E. (1990, Summer). Conclusions of a national think tank on issues relevant to community-based employment for survivors of traumatic brain injury. *American Rehabilitation*, 20-24, 33.

Thomas, D. F., & Menz, F. E. (1993). *Head injury re-entry project (Project HIRe)*. Final report. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Thomas, D. F., & Menz, F. E. (1993, August). *Preliminary report of the pilot study of the Vocational Assessment Protocol: A process for identifying and planning for individuals with traumatic brain injuries in community-based employment*. Paper presented at the Midwest Regional Head Injury Center for Rehabilitation and Prevention, Chicago, IL.

Trexler, L. (1993). Neuropsychological evaluation of persons with traumatic brain injury. In D. Corthell (Ed.), *Community-based employment following traumatic brain injury* (pp. 57-80). Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Twelfth Institute on Rehabilitation Issues. (1985). *Rehabilitation of TBI (traumatic brain injury)*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Twentieth Institute on Rehabilitation Issues. (1993, November). *Employment outcomes for persons with acquired brain injury*. Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.

Vocational Evaluation and Work Adjustment Association. (1978). *Vocational evaluation and work adjustment standards with interpretive guidelines and VEWAA glossary*. Menomonie: University of Wisconsin-Stout, Materials Development Center.

Wachter, J. F., Fawber, H. L., & Scott, M. B. (1987). Treatment aspects of vocational evaluation and placement of traumatically brain injured adults. In M. Ylvisaker & E. Gobble (Eds.), *Community re-entry for head injured adults* (pp. 259-299). Boston: Little, Brown and Company.

Wehman, P., & Kreutzer, J. S. (1990). *Vocational rehabilitation for persons with traumatic brain injury*. Rockville, MD: Aspen Publishers, Inc.

Wehman, P., Kreutzer, J., West, M., & Diambra, J. (1989). Cognitive impairment an remediation: Implication for employment following traumatic brain injury. *Journal of Head Trauma Rehabilitation*, *4*(3), 66-75.

Wehman, P., West, M., Sherron, P., Groah, C., & Kreutzer, J. (1993. Return to work: Supported employment strategies, costs, and outcome data. In D. F. Thomas, F. E. Menz, & D. C. McAlees (Eds.), *Community-based employment following traumatic brain injury* (pp. 227-250). Menomonie: University of Wisconsin-Stout, Stout Vocational Rehabilitation Institute, Research and Training Center.